8-2019

From Harmony to the Field

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by

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Bachelor of Music, Berklee College of Music, 2006

A THESIS

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Fine Arts

(in Intermedia)

The Graduate School

The University of Maine

August 2019

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Thesis Advisors: N.B. Aldrich, MFA and Dr. Michael Lang

An Abstract of the Thesis Presented
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This document expounds a brief history of Western musical art, from the mid-nineteenth century to the beginning of the twenty first, which traces the complete transformation of its expressive means and materials. Examined are the changes to Western music's basic materials such as pitch system, timbral palette and formal architecture. We observe as these aspects are dismantled, supplanted by a dramatically expanded sonic palette and subsequently expanded ranges of expression and topical consideration.

This brief historiography contextualizes my current working theories and methods for the construction and understanding of electroacoustic music, centered around the idea of The Field, which frames my work and my views of others' works. But more importantly, The Field is an attempt to move the model for work away from human rationality and place it in an aspect of the world.

Next, a chronological survey a selection of recent work will elucidate a shift in my own expressive materials and media. This is followed by the relating of the genesis and context of my thesis work, *field: alarum, implication* (v.2), situating it in The Field and in the body of work.

Ultimately, this paper exemplifies my striving to understand and contextualize my practice and to deepen and focus my practical, theoretical and critical engagement with it.

DEDICATION

To my parents, Sandi and Dave,
for their love and support over these many years,
who are likely wondering why this took so long.

And to my sister, Susan,
who got a new heart just as
I began this adventure.

ACKNOWLEDGEMENTS

In the exercise of this thesis, I am deeply indebted to my terrific thesis committee—N.B. Aldrich, Michael Lang, Sofian Audry and Joel Chadabe—without whose guidance this work would have been a much poorer effort. They were, to a person, full of brilliant and diverse ideas and opinions, and each with their own particular angle regarding this project, based on their varied areas of expertise. Without fail, I left each of my committee meetings excited by our stimulating discussions.

Particularly, I must single out the efforts of N.B. Aldrich without whose insights, mentorship, camaraderie and persistent challenges over the past three years I would have had a drastically diminished experience. Especially during this past thesis-focused year, his willingness to follow up written feedback with clarification via phone calls, rounds of text-tennis or a home-cooked dinner has made a dramatic difference in the quality of the present outcome.

I am also grateful to Owen Smith and all my faculty and colleagues at the Intermedia MFA program, as well as the faculty and students in the New Media program, for making this an extraordinarily rich and memorable learning experience. Amongst this group, I want particularly to thank Alicia Champlin and Eleanor Kipping who, in addition to being great friends, served, perhaps unknowingly, as models and examples as they moved through the program one year ahead of me, and from whom I learned a great deal.

Thanks are due also to Francisco López and Barbara Ellison, who directed the Sonic Mmabolela residency in South Africa, where I gathered sound material for my thesis piece. I am grateful also to my co-participants on that trip, who were very generous with their insights and expertise. Further thanks

are due to Francisco (once again) and to Luciano Chessa for providing first-hand material which bolstered my arguments and assertions here.

To my family—Tess DeCosta and Katie Pieters, Theo Norton, Susan Norton, John Ross, John and Maryalice Norton, Sandi and Dave Norton, Janet Hill and Janet S. Hill—I am deeply appreciative of your support and forbearance while I have been so otherwise occupied!

And to friends and colleagues in Boston as well as far-flung, thank you for hanging in there with me: Michael Rosenstein, Dave and Polly Hanson-Grodsky, Angela Sawyer, Leslie Ross, Zeke Finkelstein, Howard Martin, Jesse Kenas Collins, Matt Samolis, Joe Burgio, Tom Plsek, Curt Newton, Jennie Evans, Danny Gromfin, Phil Kudla, Monique McNally, Murray Barg, Vic Rawlings, Liz Witte, Lou Bunk, Nancy Koppelman, Lee Filipe, Joe Mahoney, Geoff Cisler, Mike Bullock, Linda Aubrey, Id M Theftable, Al Margolis, Walter Wright, Maryann Kearns, Dave Grollman, Lucio Menagon, Chris Strunk, Noell Dorsey, Teresa Czepiel, Paul Kafka-Gibbons, and Dei Xhrist.

Special thanks!

to Dave H-G for the commiseration

to Michael for all the hard work and good fun

and to Tess and Katie for everything.

RIP

Sandi Tillotson Norton

Marc Bisson

Wayne Cochrane

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INTRODUCTION

Before joining the Intermedia MFA program at the University of Maine, I had had a nearly thirty year practice as a performer and composer (of avant-garde jazz, free improvisation and experimental music) as well as a field recordist, photographer and graphic designer. By 2009, the performance of free improvisation had come to dominate my creative life. I arrived at the program in 2016 with a desire to understand and contextualize my various artistic practices—why was I doing what I was doing?—and also to deepen and focus both what I was doing and my theoretical and critical engagement with it.

In the first chapter of this document, I trace a brief history of Western musical art which follows a complete transformation of its expressive means and materials, starting with Wagner's Prelude to *Tristan und Isolde* in 1859, through the twentieth century to the soundscape composers, ending there in 2007. After this synopsis, in section 1.7, I elaborate an idea I have been working out for the past year—the idea of The Field—which is my way of creating a model for the construction or, perhaps more accurately, for the understanding of electroacoustic music.[1]

This particular historical arc illustrates a long process of changing not only the material but the focus, the topic of the musical artwork. Prior to our starting point, Western art music was guided by logical notions such as scales, chord progressions and a balanced formal architecture handed down by tradition. The language of the material was abstracted from the world and the ideas of 'right' and 'wrong' were reassuringly clear. But along the way every aspect of this framework becomes complicated, then troubled and finally dismantled. Stable harmonic relationships are destabilized; rhythmic alignment amongst voices, abandoned; and the abstract pitch organization of standard concert

instruments overthrown for a dramatically expanded palette consisting of any sound which exists or can be imagined, thereby dramatically expanding the range of topical consideration.

With The Field, my goals are to elaborate my approach to field recording and electroacoustic composition; to show how my model follows from the history I was born into, for better or for worse; to explicate it as a guide for possible use by others and to use it as a lens through which to view others' work. But most importantly, I wish to suggest a way to countermand the hubris of human subjectivity by the placement of the model for work back in the world rather than in the logic of humanity. [2]

In chapter two, I will chronologically survey a selection of the work I have made while in the program. This will elucidate two trends. One is the arc—similar to that of the musical history outlined in chapter one—of the shift from the abstraction of traditionally musical materials to the use of more indicative, world-based soundscape materials. The second, at the service of the first, is the supplanting of a photographic practice with field recording. These are both quasi-documentary media, but this shift focuses all of my energies in the sonic realm, where I feel I am most articulate.

Chapter three relates the genesis and context of my thesis work, *field: alarum, implication* (v.2), situating it in The Field and in the body of work. It is my sincere hope that these works open a space for contemplation for the listener, and point toward a practice that moves toward the world, not the human, as the model for procedure.

—Steve Norton
Orono, Maine, August, 2019

CHAPTER 1 – FROM HARMONY TO THE FIELD (CONTEXTUAL REVIEW AND THESIS)

1.1 The Western harmonic tradition, exhausted [1]

1.1.1 The beginning of the end: Richard Wagner, *Tristan und Isolde* (1957–59) Richard Strauss, *Also sprach Zarathustra* (1896)

Richard Wagner (1813 – 1883) was a German composer of operas; he developed the form of the music drama [2] in his mature work, after 1850. He was active from 1826 to his death in 1883, and is considered by many "the outstanding composer of German opera, and one of the crucial figures in the history of nineteenth-century music." [3] Richard Strauss (1864 – 1949) was a German composer primarily of "tone poems" (a term he preferred to the more commonly used "symphonic poem") and operas. He was precocious, composing music for most of his life, and is widely held to be "the dominant figure in German musical life during the first part of the [twentieth] century." [4]

The opening chord of the "Prelude" to Richard Wagner's music drama *Tristan und Isolde* (1857–1859) is a four-note chord of surprising ambiguity which resolves to another dissonant chord, suspending any determinations regarding the question, "What key are we in, then, Richard?" until, well, essentially the end of the movement. And even then, nothing is certain. This piece moves from suspension to suspension in a constant state of yearning, consistent with the theme of the work and marking the beginning of the beginning of the end of the Western tonal harmony project.

A fine candidate for the end of the beginning of the end would be Richard Strauss's *Also sprach Zarathustra*, composed in 1894. Throughout the entire composition, there is a "constant play of contrast between the tonalities of C [major] and B [major]" [5] (two keys which have only two out of seven possible

notes in common), but it is in the tonally ambiguous ending, wavering between a B-major chord in the treble winds and a low C in the 'cellos and double basses, where we see for the first time a major concert work refuse to resolve to its tonic chord at the end of its final moment. Indeed, it cannot, as it has essentially refused throughout to make up its mind regarding what that tonic is.

In this environment of suspension and uncertainty, one cannot help but note the coincident publication, in 1859 (i.e., the year of the completion of *Tristan und Isolde*), of Charles Darwin's *On the Origin of Species by Means of Natural Selection* and the social turmoil resulting from this event. Loren Eiseley notes in his book *Darwin's Century* that "[t]he year 1859 is generally regarded as the climactic point in the long, involved, and somewhat sporadic efforts toward the development of a satisfactory explanation of organic change. In that year, Charles Darwin published the *Origin of Species* in which he dared only one solitary and wary sentence upon the evolution of man…" Eiseley accounts Darwin's wariness to "the oppressive theological atmosphere of the time," and further down he remarks, in passing and without detail, on "the clamor that arose after [Darwin's] book appeared".[6]

1.1.2 The middle of the end: Charles Ives, *Symphony No. 4* (1910 – ca. 1924)

Charles Ives (1874 – 1954) was an early twentieth-century American composer of unusual proclivities. Thanks to strong familial encouragement and relative isolation from the American—to say nothing of the European—music world, he pursued a highly individualistic course during his approximately thirty years of active composing, pioneering many techniques which would reach currency only much later, with Ives' work eventually becoming "of incalculable importance to younger generations of American musicians," according to music historian Donald Jay Grout.[7]

In the early 1900s, Ives began the practice of weaving popular tunes into the fabric of his compositions, often with more than one sounding simultaneously. He developed and refined this

technique over the course of his career, and it reaches its apotheosis in the second movement, the "Comedy," of his *Symphony No. 4* (1910–ca. 1924). In this movement, we have slipped our moorings and drifted out into a heaving sea of musical styles, one washing over another, and another: folk tunes, hymn tunes, stentorian modernism, marching bands, popular song. Never mind *Also sprach Zarathustra*'s ultimate non-resolution of a B major chord against a low C—here we have entire orchestral subgroups walking over one another, each playing something entirely different, or a solo violin intoning a sweet song while a piano tuned in quarter-tones[8] meanders drunkenly in a different tempo in the background. Many of the individual scraps in Ives' crazy quilt behave in perfectly sane and functional harmonic manners, but the aural fabric as a whole can be quite disorienting. While the piece starts on the note D and comes to a placid end on a D-major chord, for much of the time a clearly established tonality is nowhere within earshot. Due to the size of the orchestral forces Ives employs and the sheer density of the musical information, the *Symphony No. 4* seems much weightier and longer than it actually is—a performance generally runs just under thirty-five minutes, a modest duration of modernist concision for a four-movement work coming shortly after the romantic gigantism of Strauss and Mahler.

1.2 From harmony to sound

> I believe that the use of noise to make music will continue and increase until we reach a music produced through the aid of electrical instruments which will make available for musical purposes any and all sounds that can be heard.
>
> —John Cage (1937) [9]

1.2.1 The end, finally: Edgard Varèse, *Ionisation* (1929–31)

Since at least early adulthood, Edgard Varèse (1883 – 1965) was explicit in his dissatisfaction with the sonic resources available to the concert composer. In a retrospective interview with Gunther Schuller taken in 1965, Varèse reports that "by [around 1905] I was already disenchanted with the [equal-]tempered system… and could never understand why we should be limited to it when our instruments can give us anything we want, and why it should be imposed as a prescriptive, as if it were the final stage of musical development. In other fields, like chemistry or physics, the basic assumption is that there is always something new to be discovered." [10]

Varèse was born in France, but is generally considered an American composer. In 1907, after a truncated but evidently thorough-enough music education in Turin and Paris, he came upon a musical tract/manifesto by Ferruccio Busoni (1866 – 1924) which called "for a drastic revision of the basic concepts of melody and harmony… [and for] new instruments capable of creating sounds of which previous composers had only dreamed." [11] Varèse immediately moved to Berlin to study with Busoni and then established himself as a composer and conductor. However, he achieved only modest success and continued to feel hemmed in by pervasive traditional attitudes, so in 1915 he traveled to the United States with the hope of finding the artistic freedom and support he desired. [12]

Varèse's *Ionisation* (1929–31), arguably the first major concert work for percussion instruments only, was written after a period of wrestling with the restrictions of the standard orchestral palette. His hoped-for new instruments which would open up new horizons in available sounds had not yet materialized (although he was tantalized by René Bertrand's experiments, which would later lead to the Dynaphone[13]), so Varèse, who would come to prefer the term 'organized sound' to 'music,'[14] took matters into his own hands in his efforts to 'drastically revise the basic concepts of melody and harmony.' Composer and chronicaler Michael Nyman asserts that "[*Ionisation*] is the first musical piece to be organized solely on the basis of *noise*, or rather on the basis of instruments of indefinite pitch, or, if pitched, incapable of normal intervallic progression (the piano, too, is used purely as a percussion instrument)."[15] And indeed, with *Ionisation*, we have now left the realms of melody and harmony entirely behind. To be sure, many of the rhythms, particularly in the higher parts (side and snare drums, bongos, castanets, maracas, wood blocks, various unpitched metallophones), are recognizable as falling within the scope of the standardly notatable, but any organization or progression via means of pitch is absent; we are now following a logic of sound rather than a logic of harmony.

As an aside, and contra Nyman's assertion (noted above) regarding the historical primacy of *Ionisation*, it must be pointed out that fifteen years before its completion, Italian visionary, composer and designer of instruments Luigi Russolo mounted the first concert of an orchestra of eighteen of his *intonarumori*—literally 'noise intoners,' or mechanical noise-generating instruments.[16] This event would likely contain compositions by Russolo which would properly lay claim to being "the first musical piece[s] to be organized solely on the basis of *noise*." But, on yet the other hand, we will need to cut Mr. Nyman some slack. His text is copyright 1974. In correspondence with composer and Russolo scholar Luciano Chessa, Chessa confirmed to the author that "When Nyman wrote the book, there wasn't a

whole lot available on Russolo in English: that's why!" [17] Indeed, although Russolo's manifesto "The Art of Noises" was known in English, the full book, *The Art of Noises*, was not generally available in English until 1986 (translated and with an introduction by Barclay Brown). [18] Chessa continues: "Additionally, Varese knew of Russolo's art of noises at least since 1917 (see my book), and they became friends in Paris in the mid-1920s." [19] In the present context, this is revealing and germane.

1.3 *Musique concrète*

1.3.1 Letting sounds be themselves

Varèse's accomplishments (above) can be seen in the context of a cloud of developments begun at the end of the nineteenth century, an undercurrent which would rise to the surface later in the twentieth century with significant force. Composer and historian Joel Chadabe, in his book *Electronic Sound*, describes these developments as "the great opening up of music to all sounds." [20] In Berlin in 1907, Ferruccio Busoni (1866 – 1924) published his *Sketch of a New Esthetic of Music*, [21] which called for new materials and procedures in the musical arts. This in turn affirmed similar desires in the young Frenchman Edgard Varèse, who would go on to actualize these ideas as soon as the technical means became available. Shortly thereafter, in 1913 in Italy, Luigi Russolo published his *The Art of Noises*, a manifesto describing his vision for a music of the future, consisting of rumbles, roars, explosions, crashes, thuds, booms, whistles, hisses, &c. He would go on, later that year, to design and build, with percussionist Ugo Piatti, his aforementioned *intonarumori*. [22]

In approximately 1937 in America, John Cage (1912 – 1992), because of his involvement at the time in writing percussion music and because untuned percussion sounds do not provide for melodic or harmonic logics, would begin to devise new structural methods for organising music based on time

rather than melody or harmony. To accomplish this, he needed to consider his materials anew. In doing so, Cage concluded that all sounds, including noises, had pitch, loudness, timbre and duration, while silence had only duration. So he began to create scores which were empty vessels—initially measured in metric lengths but later measured simply in timings—into which he could pour any sound, whatever was at hand. He realised these principles over the following decade and beyond, filling his time-based forms with musically notated percussion and prepared-piano [23] sounds as well as diverse found sound from phonographs and radios, electronic oscillators and tin cans. [24] [25]

Composer and historian Lowell Cross summarises these developments in the years prior to the mid-twentieth century concisely, and with a slightly larger cast of characters: "Figures as diverse as Busoni, Schoenberg, Varese, Schillinger, Stokowski, Chavez, and Cage had all postulated before World War II that new compositional procedures were forthcoming..." [26]

1.3.2 Pierre Schaeffer, *Étude pour les chemins de fer* (1948), reduced listening, sound objects

On October 5, 1948, Pierre Schaeffer (1910 – 1995) broadcast a group of new compositions in his "*Concert de bruits*" (Concert of Noises) on French radio [27] (i.e., *Radiodiffusion Française*), signaling the start of a new era of musical composition with the introduction of a musical material form he called *musique concrète*. *Musique concrète* was the composition of music utilising manipulated, pre-recorded sounds, which Schaeffer considered 'concrete' in contrast to the abstract symbols of notes on a score. This method was the result of Schaeffer's long period of experimentation in the studios at *Radiodiffusion Française* where he had worked for most of his career up to that point, learning the techniques and possibilities of the technologies he had at hand. His manipulations of recorded materials at the time consisted of repetition via his 'closed groove' (essentially, looping), changing of pitch by speeding up and slowing down, reversing a sound, altering a sound via editing (particularly removing the initial attack) and combining

sounds by playing them simultaneously. Until 1951, when the studios acquired tape recorders, Schaeffer accomplished all of this utilising disk recorders, playback turntables and mixers.

The "Concert" was a broadcast of Schaeffer's *Cinq études de bruits* (Five Noise Studies, 1948). The first of these studies, the three-minute *Étude aux les chemins de fer* (Railroad Study), was the first *musique concrète* composition he had completed, earning it a unique place in music history. This *étude* was made from the recorded sounds of trains; the manipulations applied in this case are few: primarily repetition, along with a small amount of pitch alteration. The piece has an elegant and easily grasped tripartite structure which Schaeffer elaborates using the train's whistle as a formal marker. To a concert music listener hearing *musique concrète* for the first time, the sound quality would probably have seemed crude. Certainly to our ears, the editing seems coarse but the piece has its charms, particularly the variously juxtaposed rhythmic textures and the various treatments of the whistle sounds.

Schaeffer theorized extensively on the subject of *musique concrète*, publishing at least three volumes on the topic. Principal among his many conceptual innovations were the ideas of 'reduced listening' and the 'sound object.' Schaeffer's writings were not translated into English until quite recently; fortunately, composer and theorist Michel Chion, who worked closely with Schaeffer in the 1970s wrote a book called *Guide to Sound Objects*, which attempts to communicate Schaeffer's ideas to a broad audience. Chion's writings were *the* English-language access to Schaeffer's theories for many years. [28] In Chion's *Guide*, he describes 'reduced listening' as follows: "Reduced listening is the listening attitude which consists in listening to the sound *for its own sake*, as a *sound object*, by [setting aside, ignoring] its real or supposed source and the meaning it may convey." [29] This practice asks the listener to focus on the literal aspects of sounds, i.e., their amplitude (volume), frequency (pitch), timber and duration. Chion continues, "More precisely, [reduced listening] reverses the twofold curiosity about causes and meaning (which treats

sound as an intermediary allowing us to pursue other objects) and turns it back on to the sound itself."[30] By focusing on the phenomenal qualities of the sound, the composer can evaluate the sound *as itself* with the intention of selecting unitary sections of sound which can be used as 'sound objects.'

In his work at composing with recorded sounds, Schaeffer found that he needed identifiable units of sound to work with. His solutions to this problem are already evident in the *Étude aux les chemins de fer*: the initial whistles (three of them), the rhythmic chuffing, clacking and whirring units.[31] Noting the coherent nature of these short sound units, Schaeffer posited them as 'sound objects'. Chion explains Schaeffer's ideas: "The name sound object refers to every sound phenomenon and event perceived as a whole, a coherent entity, and heard by means of *reduced listening*, which targets it [i.e., the sound phenomenon] for itself, independently of its origin or its meaning."[32] It is perhaps useful in this context to consider that an object is anything one knows the boundaries of.[33]

1.4 Simultaneity

1.4.1 Flashback: Charles Ives, *Symphony No. 4*

Thus far, we have been focused on the stuff of musical sounding and its logic (i.e., notes, sounds). Now we shall move on to rhythmic organization. When we left our hero Charles Ives and his *Symphony No. 4*, he was allowing sub-groups of musicians within the orchestra to run amok, following the logic of their own particular material and stomping all over each other, aurally speaking. To a traditional listener, not only was this confusing from a pitch and key perspective, but from a rhythmic perspective as well. Until this point in the history of Western art music, the entire ensemble, regardless of its size, has always been focused on a common rhythmic purpose, with everyone marching in the same direction, so to speak. But in this example, among his orchestral sub-groups, Ives uses independently-aligned phrasing,

polyrhythms, quick alternation among ideas and separation via dynamics and tonality (key) to achieve his goals of conveying multiple musical discourses sounding in the same space simultaneously. Ives had a clear model for this technique: when he was in his teens, his father, a former army band leader and Ives' primary music teacher, arranged for two marching bands to play different pieces while marching around the town square in opposite directions.[34]

1.4.2 Elliott Carter, *String Quartet No. 2* (1959), *Double Concerto* (1961), &c.

As is typical with Ives, it took the music world quite some time to catch up with his innovations around simultaneity. Elliott Carter (1908 – 2012) (do the math!) was introduced to Ives as a boy of fifteen by his high school music teacher, Clifton Furness. Carter became very familiar with Ives' work over the next couple of decades, and even though he was occasionally critical of Ives[35] (mostly for reasons involving the politics of the music world), the older man's work clearly had significant influence on his own.[36] In the late 1950s, the true onset of his mature period, simultaneity became one of Carter's signature structural ideas. Indeed, even in pieces from the beginning of his maturity, in the late 1940s through the mid-1950s, one finds long stretches of rhythmically differentiated texture among the voices. For instance, the first 203 measures of the *String Quartet No. 1* (1951) pass with only rare instances of any two of the voices playing in rhythmic alignment.[37] (Carter, in the program notes for the quartet describes its textures as "almost constantly diversified."[38]) However, it is the *String Quartet No. 2* (1959) which kicks this project into high gear.

In the seven years between the *Sonata for Flute, Oboe, Cello and Harpsichord* (1952) and the second *Quartet*, Carter's tonal vocabulary changed significantly: the second *Quartet*'s note-to-note procedures are now thoroughly atonal. This is not to say 'atonal' in a Schoenberg/Webern sense, but rather using procedures that Carter developed himself. In this work, Carter differentiates the four voices in their

pitch content as well as their rhythmic character. In his program notes to the score, he discusses the voices in ways that suggest personality traits and interpersonal interactions, as in the following description of the first violin part: "It dominates the first movement…, partially imposing its ideas on the others."[39] In a 1971 interview, Carter succinctly describes the four voices of this work as "simultaneously interacting heterogeneous character-continuities."[40] Whether or not one discerns the nature of these personality-like characters, the sonic result of this schema is to render each of the four voices distinct, so that they are effectively never playing music that is materially the same. This takes Ives' playing of two musics at the same time up a few notches.

Within two years after the *String Quartet No. 2*, Carter completed his *Double Concerto for Harpsichord and Piano with Two Chamber Orchestras* (1961). The *Concerto* teams each solo keyboard with a tiny, eight-piece orchestra and then explores all manner of oppositional arrangements amongst the players, or, as Carter puts it in the score's program notes, "confrontations of diversified action-patterns and a presentation of their mutual interactions, conflicts, and resolutions, their growth and decay over various stretches of time."[41] As with the second *Quartet*, Carter uses a scheme to differentiate the musical materials and behavioral traits of the two groups. The resulting work is at times almost impenetrably dense and complex, but even at most times of high density, the listener can discern contrasting types of material between the two groups.

Carter's *oeuvre* proceeds from this point with the ideas of simultaneous, differentiated or "diversified" voices as a given. Often, the titles will make ensemble subdivisions explicit, as in *A Symphony of Three Orchestras* (1976), *Triple Duo* (1984) and its flipside, *Double Trio* (2011), and the *Penthode* (1985) for five instrumental quartets. Other outstanding examples include the *Piano Concerto* (1965) in which a concertante grouping of seven instruments joins the piano, aiding and abetting in its struggle

against the orchestra, the *String Quartet No. 3* (1971) wherein the quartet is divided into two duos so differentiated they don't even share barlines, and the *String Quartet No. 4* (1986), which returns to the four independently diversified voice scheme of the second *Quartet*. Clearly, the idea of multiple, rhythmically unsynchronized voices became one of the core tenets of Carter's compositional style. In many other ways, his compositional roots and attitudes were deep in the nineteenth century: he wrote deterministic, through-composed music; he disliked Ives' musical borrowing (a twentieth-century aesthetic gambit if ever there was one!) and publicly criticised Ives—a person very important to his own artistic development—for it.[42] But clearly, as Joel Chadabe puts it in *Electric Sound*, "The idea of an asynchronous universe was in the air,"[43] and Elliott Carter had obviously caught wind of it and applied the idea within his aesthetic domain.

1.4.3 John Cage, *HPSCHD* (1967–69) (composed with Lejaren Hiller)

John Cage's *HPSCHD* (completed in 1969) is seemingly an attempt to *render* an entire asynchronous universe in miniature. By 1969, Cage had had a musical career of nearly forty years. At this point he was famous, and had already dramatically influenced the music world as well as the art world—consider, e.g., 4′ 33″, his famous "silent piece." (In 1986, he would be conferred an honorary 'Doctor of All the Arts' degree by the California Institute of the Arts.[44]) A few years prior, he had begun making works which presented material in extreme abundance. He received a commission from Swiss harpsichordist Antoinette Vischer for a work for harpsichord. Not particularly enthusiastic about the harpsichord, he nonetheless forged ahead after speaking with composer and computer scientist Lejaren Hiller about working with the computer facilities at the University of Illinois, Urbana-Champaign. The two began to work on the piece together, using the computer to generate algorithmically altered music for the harpsichord. One of Hiller's computational subroutines was called HPSCHD, which became the title of

the piece. *HPSCHD* (and other Cage pieces like it) represent dramatic increases in simultaneity over essentially any other Western art music.[45]

The premier of *HPSCHD* took place on May 16, 1969 in the (very large) Assembly Hall on the campus of the University of Illinois, Urbana-Champaign; the event lasted four hours and was experienced by an estimated seven thousand people. This experience/happening/extravaganza consisted of seven amplified harpsichords at which seven harpsichordists played seven harpsichord solos as often as they wanted to. There were also fifty two[46] tape recorders with amplification which were available to play any of 208 prepared tapes which contained hundreds of thousands of computer-generated pitches, pitches which were computer-determined from across the audible frequency spectrum. Screens were hung around the entire auditorium onto which eighty-four slide projectors and twelve movie projectors beamed still and moving images. And if this doesn't seem enough like a carnival already, "posters were displayed, popcorn and candied apples were available and silkscreen facilities created souvenir T-shirts on the spot."[47] Six of the seven harpsichord solos were computer-generated from a variety of algorithms which were worked out by Cage and Hiller and programmed by Hiller, who ran the Experimental Music Studio[48] at UIUC. The seventh "consisted of the instructions to the performer: 'Play anything you desire.'"[49] By all accounts, the environment in Assembly Hall was nearly overwhelming. Depending on one's attitude, this translated to either "excruciating" or "wondrous." The individual harpsichord solos were difficult to pick out of the din, but clearly this was not the point, which, one imagines, may have disappointed Ms. Antoinette Vischer, the commissioning Swiss harpsichordist. Cage's goal was that the hall be filled to near-overflowing with sights and sounds, a geography within and through which the audience was free to move and experience in whatever way they saw fit.

1.5 Spatiality/Spatialization

1.5.1 Karlheinz Stockhausen, *Gruppen* (1955–57)

Karlheinz Stockhausen (1928 – 2007) wrote the complex and massive *Gruppen* (completed in 1957) before he was yet thirty years of age. The piece requires the division of a large orchestra of 109 players into three smaller orchestras each requiring their own conductors. These three orchestras are positioned roughly in a U-shape: to the left, in front of, and to the right of the audience.[50] The three conductors are required to keep *Gruppen* coordinated, because the three orchestras often play at different tempi (i.e., speeds).

Why are we now talking about spatiality? How is *Gruppen* different from Elliott Carter's *Symphony of Three Orchestras*? Stockhausen, in *Gruppen* seems to be working to address different concerns than Carter. The two most prominent domains of concern here are procedure and placement (in space). Stockhausen's music in *Gruppen* proceeds texturally, where small groups of instruments will coalesce into timbrally homogeneous 'blocks' of sound, which Stockhausen calls "moments." We will let him speak, from *Stockhausen On Music, Lectures & Interviews*, compiled by Robin Maconie:

> When certain characteristics remain constant for a while—in musical terms, when sounds occupy a particular region, a certain register, or stay within a particular dynamic, or maintain a certain average speed—then a moment is going on: these constant characteristics determine the moment. It may be a limited number of chords in the harmonic field, of intervals between pitches in the melody domain, a limitation of durations in the rhythmic structure, or of timbres in the instrumental realization.[51]

Stockhausen began articulating this idea of moments to himself with the beginning of the composing of *Momente* in January 1961;[52] Yet, *Gruppen* (composed from 1955–1957) seems constructed

with very similar principles. Stockhausen confirms this was possible: "To those who know my previous works, it will be obvious that all the formal determinations did not simply fall out of the sky, but can be found in preparatory form here and there in earlier compositions."[53] It is clear that he had begun to think along these lines as early as the mid-1950s. There is no denying that *Gruppen* moves very clearly from texture to texture, sometimes abruptly and sometimes with transitional textures between them.

The second domain, placement of sound in space, relates directly to the spatialized placement of the sounds via the distribution of the orchestral groups *vis a vis* the audience. (See fig. 1.1., below.) Stockhausen uses this layout to move sound around the audience, achieving fascinating results. An exemplary and prominent instance of this phenomenon comes almost exactly two-thirds of the way through the work. At one bar after number 119 in the score[54] (16:02 on our recording[55]), Stockhausen

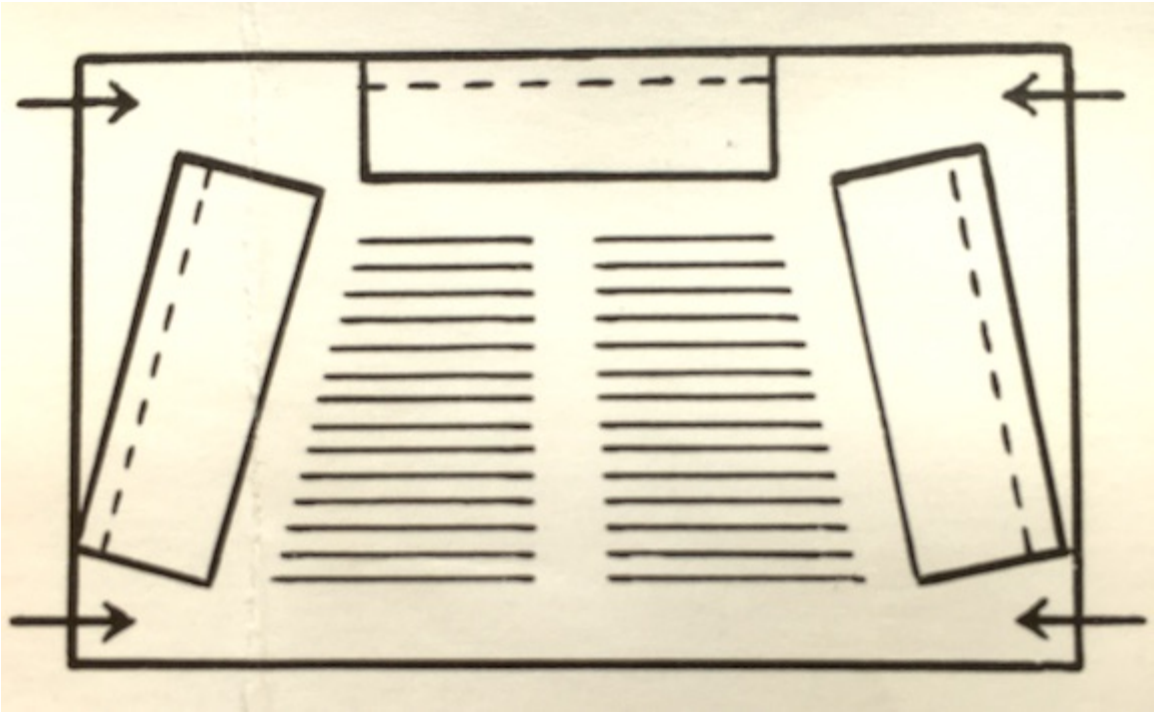

Figure 1.1. Diagram from the performance notes for *Gruppen*,[56] showing the position of the orchestra platforms *vis a vis* the audience. The conductors stand at the center of each dotted line, facing toward the audience.

passes brass chord swells rapidly around the audience, after which, at score number 120 (16:19), the piano in the center orchestra takes over alone for a stabbing solo which is occasionally commented on by the brass, quietly recapitulating their chordal gesture. These are particularly dramatic moments, but Stockhausen's handling of the spatial aspect of *Gruppen* is exceedingly effective throughout the piece.

To answer the second question at the top of this section, "How is *Gruppen* different from Elliott Carter's *Symphony of Three Orchestras*?", while spatiality must *per se* be a concern for anyone separating an orchestra into multiple sub-groups, it is more of a practical concern for Carter, used to clarify his procedure, rather than to help drive it. Each of his orchestras contains different instruments from the others; they each use different melodic/harmonic material from the others; and while they each play four movements, the divisions of the four movements are different for each orchestra.[57] Carter states, in his program notes in the score, "There is a continual overlapping and changing flow of music. The listener of course, is not meant, on first hearing, to identify the details of this continually shifting web of sound any more than [she or] he is to identify the modulations in Tristan und Isolde, but rather to hear and grasp the character of this kaleidoscope of musical themes as they are presented in varying contexts."[58] This is far more a concern for simultaneity, and the very opposite of moment form.

1.5.2 Spatiality as such
John Cage, *Williams Mix* (1952), Varèse, *Poème électronique* (1958)

Spatiality itself came into focus as a concern for the European avant garde in the early 1950s due to the sudden interest in electroacoustic music[59] of all types—initially the *musique concrète* based in Paris, and the *elektronische Musik* coming out of Cologne. These musical modes required speakers, resulting in a sudden profusion of problems to solve around the goal of effectively filling a room with an acoustic diffusion corresponding to that which the composer wished their audience to experience. Certainly,

Stockhausen wrestled with these problems, which would have suggested to him the notion of spatializing orchestral forces as well.

Spatiality, or spatialization, was initially a concern in the late Renaissance and early Baroque periods. It was a development of the ancient practice of antiphonal or responsorial singing (introduced into Western music in the fourth century[60]). In Venice in the early fifteenth century, works described as 'polychoric' (i.e., with multiple choirs, usually supported by instruments) exploited the massive spaces and resources of the ecclesiastic architecture of the time such as St. Marks, which had two organs, each on opposite ends of the church.[61] The music of Giovanni Gabrielli (1554/1557 – 1612) is considered the apex of the period.[62] The practice waned by the end of the baroque, as music performance became more of a secular, concert event, its details not well served by the blurry cathedral acoustic.

Since returning as a focus in the early 1950s, spatialization has only grown in importance. It is now regarded as a fundamental characteristic of sound, along with parameters such as amplitude, frequency, duration, &c.[63] Prominent early examples abound. The following two illustrate a dramatic spatial range.

John Cage's *Williams Mix* (1952) is a piece of *musique concrète* for eight independent monaural channels. Recording engineers Bebe and Louis Barron provided Cage with tapes of over 600 recorded sounds, which were evaluated and categorized by sound type—city sounds, country sounds, electronic sounds, &c. Cage's score indicated the pattern by which the sounds would be arranged on the eight tapes. The actual sounds in each position were chosen via chance operations using their categories. *Williams Mix* was premiered in a concert hall at the University of Illinois Arts Festival in March, 1953. The eight tape players played through eight loudspeakers which were spaced equidistantly around the hall, surrounding the audience.[64]

Edgard Varèse's *Poème électronique* (1958) was created for Le Corbusier's Philips Pavilion at the 1958 Brussels World's Fair. It was most of the audio portion of Le Corbusier's spectacle of light, visuals and sound (at the time of the commission, Corbusier had promised Philips he would make them "a *poème électronique*") which was to be projected into the pavilion space. The piece consists of recorded sounds (including instrumental and vocal sounds) as well as some electronically generated sounds, which were recorded and processed; the result is an eight minute work of fascinating variety. Joel Chadabe considers it "the ultimate statement of tape music as *musique concrète*." [65] Varese describes the musical diffusion mechanism: "The music was distributed by 425 loudspeakers; there were twenty amplifier combinations... The loudspeakers were mounted in groups and in what is called 'sound routes' to achieve various effects such as that of the music running around the pavilion, as well as coming from different directions, reverberations, etc. For the first time, I heard my music literally projected into space." [66]

1.6 The Soundscape

1.6.1 R. Murray Schafer

"The soundscape of the world is changing. Modern man is beginning to inhabit a world with an acoustical environment radically different from any he has hitherto known. These new sounds, which differ in quality and intensity from those of the past, have already alerted researchers to the dangers of the imperialistic spread for more and larger sounds into every corner of man's life." [67] These words, from R. Murray Schafer's *The Music of the Environment*, a pamphlet published in 1973,[68] brought new terms into discussions of modern music as well as new topics into the then-thriving discussion of the environment, its problems and its salvation. Citing John Cage's statement that "Music is sounds, sounds heard around

us whether we're in or out of concert halls…," Schafer posits the idea of "the soundscape" as a vast, worldwide composition that all living things and the environment itself are continuously composing. He asks, "Is the soundscape of the world an indeterminate composition over which we have no control, or are *we* its composers and performers, responsible for giving it form and beauty?" Schafer also engages the environmental discussion, pointing out that "noise pollution has now emerged as a world problem." His position is that we are creating noise pollution due to our failure to listen. In order to fight this tendency, we need to educate people, encouraging an appreciation for environmental acoustics in order to build the political will to combat and abate irritating sounds and to encourage and multiply positive sounds. He proposed ideas such as "ear cleaning" which would foster such an appreciation, and "clairaudience," the state of hearing clearly rather than being deaf to the noise pollution increasingly surrounding us. [69]

Murray Schafer (b. 1933) was Professor of Communication Studies at Simon Fraser University in Vancouver, British Columbia from 1970 to 1975. While there, he worked with students and colleagues on the ideas presented above; these included Bruce Davis, Peter Huse, Barry Truax, Howard Broomfield and Hildegard Westerkamp. In the early 1970s, the group formed the World Soundscape Project—their website [70] is the publishing and outreach platform for the artists' work, making available recordings and writings. Schafer's purpose for convening the group, as stated on the site, is "to draw attention to the sonic environment through a course in noise pollution;" it also grew out of "his personal distaste for the more raucous aspects of Vancouver's rapidly changing soundscape." As Schafer describes the Project in the liner notes to *The Vancouver Soundscape* LPs of 1973, "The aim of the World Soundscape Project is to bring together research on the scientific, sociological and aesthetic aspects of the environment." [71] This

statement wraps together the interdisciplinary complex of concerns which marks the focus of the soundscape movement to this day.

In *The Tuning of the World*, his 1977 opus [72] which is still a primary, foundational text for anyone interested in the soundscape and related areas, Schafer introduces, in addition to the terms above, new terminology which has entered the vocabulary associated with the discourse surrounding soundscapes. Following are some prominent examples:

- High fidelity environment: "one in which sounds may be heard clearly without crowding or masking." E.g., a rural soundscape. These tend to be locally particular.
- Low fidelity environment: "one in which signals are overcrowded, resulting in masking or lack of clarity." E.g., urban soundscapes. These all tend to sound the same.
- Keynote sound: "a sound or sounds which are heard by a particular society continuously or frequently enough to form a background against which other sounds are perceived."
- Schizophonia: "the split between an original sound and its electroacoustic reproduction… Electroacoustically reproduced sounds are copies and may be restated at … times or places [other than at their sources]."
- Soundmark: This is analogised from 'landmark'. Refers "to a community sound which is unique and possesses qualities which make it specially regarded or noticed by the people in that community." [73]

1.6.2 Barry Truax – The Soundscape, Acoustic Ecology

In his long career, composer, theorist and educator Barry Truax (b. 1947) has done pioneering early work, with John Chowning, in real-time FM synthesis in the early 1970s.[74] Note also his pioneering works

in real-time granular synthesis from the mid-1980s, *Riverrun* (1986) and *Wings of Nike* (1987).[75] He is one of the very few composers in the world of electroacoustic music to overtly engage themes of sexuality and gender; here, see in particular his *Androgyne, Mon Amour* from 1997.[76] Truax has also been one of the most influential theorists and chroniclers in the world of soundscape composition and its offshoots. At R. Murray Schafer's request, he joined the World Soundscape Project (henceforth WSP) as a researcher in 1973.[77] He went on to contribute dozens of articles and other writings, rivaling the bibliographical heft of Schafer himself. In 1975, Truax succeeded Schafer on the faculty of Simon Fraser University in the Communication Studies department.[78]

In Truax's 2008 article "Soundscape Composition as Global Music," he elaborates soundscape composition as not "merely another style or subgenre of electroacoustic music," but rather "an organising principle, a set of listening strategies and therefore a reference point for all electroacoustic music with real-world references."[79] In the following, particularly rich passage from the same article, Truax explains a) the commonalities between electroacoustic and soundscape composition practices, b) how the latter evolved, and c) the crucial differences between soundscape composition and similar-seeming practices such as *musique concrète*:

> "Artists coming from the electroacoustic music community join with those coming from other acoustic-based backgrounds, such as field recordists, sound artists, and those involved with acoustic design in a variety of contexts, around a common interest in what I have called 'soundscape composition'. At [Simon Fraser University], this activity evolved spontaneously from the documentation or 'found' soundscapes of the WSP. Since most of the participants were composers, they began applying electroacoustic techniques towards processing the recorded sounds, creating compositions that range from those whose sounds are transparently manipulated to those that are

much more transformed. However, to distinguish this latter approach from *musique concrète*..., I have argued that the original sounds must stay recognisable and the listener's contextual and symbolic associations should be invoked for a piece to be a soundscape composition. Music created through soundscape composition cannot be organised with much similarity to instrumental music; in fact, a broader definition of music such as 'organised sound' must be invoked if soundscape composition is to be included."[80]

Note well this final sentence. The first clause describes exactly something I attempted to do in a work, discussed in section 2.10, below, entitled *Shine on us*. (2017). I would aver—his statement is sound based on that experience. My goal was to lift the formal structure of an existing work (*Lux Aeterna* (1966), a sixteen-part *a capella* choral work by György Ligeti) and fill that structure with my own recorded material, most of it of a soundscape nature. In the context of that effort, I found the material recalcitrant and unwieldy; it refused to behave as I had imagined it would. Of course, traditional musical material has been molded and polished over time to *be* wieldy, abstracted and increasingly submissive to subjective intent, and ideal for such application.

In the final clause of Truax's sentence, above, note the congruence of the terminology "organised sound" with that used by Varèse, recounted in section 1.2.1, ¶ 3, above. Both are concerned with "a broader definition of music" which will be inclusive of the recalcitrant and unwieldy material they are both considering. Note also that from our vantage point, nearly 100 years after Varèse made his statement (in the 1920s), a term other than 'music' now seems entirely unnecessary. One would predict, understandably, that a similar shift of perspective on soundscape material will likely occur, given some length of time.

Truax was involved in the early formulations of the notion of "acoustic ecology," contributing to the World Soundscape Project's 1977 pamphlet *A Dictionary of Acoustic Ecology*, and then editing the published edition, retitled *A Handbook for Acoustic Ecology* in 1978.[81] Acoustic ecology is a practice which uses soundscape composition to explicitly foreground environmental and ecological topics and issues. It has grown as a genre of increasing focus since its nascence in the 1970s. As Truax relates in "Soundscape Composition as Global Music," "following the 1993 *Tuning of the World* conference in Banff, Alberta, the World Forum for Acoustic Ecology (WFAE) was formed, an international organisation which maintains an extensive website and soundscape newsletter and journal," [82] entitled *Soundscape, The Journal of Acoustic Ecology*. Clearly, things acoustically ecological were "in the air" in 1993, as this was also the year that Bernie Krause published his highly influential article "The niche hypothesis: A hidden symphony of animal sounds, the origins of musical expression and the health of habitats" in *Explorers Journal*.[83]

In a 2009 interview with the *Asymmetry Music* webzine, Truax stated that his primary passion, ever since starting work with the WSP, has been "extending the work of soundscape studies to what I call acoustic communication and engaging with all the real world issues, whether it's noise, or the sound environment, or the media, or listening in general, the acoustic community—in short, all the manifestations of sound, from an interdisciplinary point of view." [84] For a full explication of this topic, see his book *Acoustic Communication* (1984, revised 2001), written undoubtedly for use as course material in support of his teaching at Simon Fraser.

1.6.3 Hildegard Westerkamp, *Kits Beach Soundwalk* (1989), soundwalks generally

Hildegard Westerkamp (b. 1946) joined the World Soundscape Project and was Murray Schafer's research assistant from 1973 to 1980 [85] where her work made a significant contribution to Schafer's *The Tuning of the World.* As a composer, she has released many influential recordings of soundscape

composition. Westerkamp was a founding member of the World Forum for Acoustic Ecology and the editor-in-chief of the WFAE's journal, *Soundscape*, from its inception in 2000 through the 2011 volume.

Soundwalking, as a practice, arose from the work of the World Soundscape Project. Westerkamp writes about it early in her tenure, in an article entitled "Soundwalking" in 1974. First we will read the description of the soundwalk in *The Tuning of the World* (1977): "The soundwalk is an exploration of the soundscape of a given area using a score as a guide. The score consists of a map, drawing the listener's attention to unusual sounds and ambiances to be heard along the way. A soundwalk might also contain ear training exercises. For instance, the pitches of different cash registers or the duration of different telephone bells could be compared. Eigentones [i.e., room resonances] could be sought in different rooms. Different walking surfaces (wood, gravel, grass, concrete) could be explored. [&c.]" [86] If this sounds rigidly prescriptive, keep in mind that Schafer was focused on the education of people about the importance of sound and their sonic environment; consequently his writing was often didactic in quality. Here is Westerkamp's definition, from her article "Soundwalking" (1974): "A soundwalk is any excursion whose main purpose is listening to the environment. It is exposing our ears to every sound around us no matter where we are." [87] Simple, straightforward, flexible.

Westerkamp's *Kits Beach Soundwalk* is from a bit later, 1989. Flexibility is now the order of the day. She begins with what sounds like a straightforward soundwalk composition: she is addressing us from a putative "real location," that of Kits Beach (formally Kitsilano Beach, or *Khahtsahlano* in the First Nations language, in Vancouver).[88] There, over the soundscape sounds, she tells us what we are listening to in a straightforward fashion, but before you know it, she is playing with foreground and background in the recording, exposing the studio in the proceedings, bringing in other works (in this case, Iannis Xenakis' *Concret PH*) and generally giving notions of perspective a vigorous workout.

Beginning with the WSP's examples, and primarily Westerkamp's, the soundwalk grew into a veritable sub-genre within soundscape compositional practices. Examples of a very wide variety of approaches are within easy reach. For instance, there's Janet Cardiff's *The Missing Voice: Case Study B* from 1999 (only one of her several engagements with this method), which combines radio drama with the museum audio tour. The listener, not knowing what they are in for, is sent out into the environment and drawn into a narrative of mysterious intrigue.

Christina Kubisch pioneered an innovation on soundwalks she calls "electrical walks," where the listener/walker wears custom-made (by Kubisch herself) headsets containing electromagnetic pickups which render audible "the electro-magnetic fields of urban environments" from such sources as "light systems, wireless communication systems, radar systems, anti-theft security devices, surveillance cameras, cell phones, computers, streetcar cables, antennae, navigation systems, automated teller machines, wireless internet, neon advertising, public transportation networks, etc." [89] This work began in 2003, and has been documented on such releases as *Five Electrical Walks* (2007) and *La Ville Magnétique / The Magnetic City* (2008).

Cathy Lane's *On the Machair* [90] (2007) takes the listener on a highly impressionistic tour of a small village in the Outer Hebrides islands of Scotland. Her approach has an ethnographic feel, as she endeavors to place us there on the island amongst islanders, speaking both English and Gaelic, sheep, birds, wind, water and grasses. As listeners, we wander out onto natural landscapes, into birthday parties, and hear difficult-to-grasp, overlapping descriptions in the two languages at once.

1.6.4 Francisco López, *La Selva* (1997)

Born in 1964 in Madrid, Spain, Francisco López is the youngest artist discussed in this essay. During childhood he was fascinated by music and by nature, insects particularly. As an adult, he earned a PhD

in entomology and taught at universities for over 20 years. Concurrently, he was always deeply involved in music; he began making field recordings in the late 1970s, entirely on his own, with no context. [91] Presently he is an electroacoustic music composer specializing in significantly aestheticised soundscape compositions with scores of releases to his name; he is also a sought-after acousmatic music performer, giving performances all over the world. In addition, he has developed and direct field-recording workshops in remote locations for over a decade.

López's more soundscape-oriented works tend to be long, with large sections; transitions are frequently either very abrupt and even jarring, or quite long and gradual. *La Selva*, from 1997, is exceptional even to these descriptions. Described on the packaging as "sound environments from a neotropical rain forest," *La Selva* was recorded during the rainy seasons of 1995 and 1996 at the La Selva Biological Station and reserve, Heredia Province, Costa Rica. Climatically, La Selva is in the tropical wet forest life zone, and receives four meters of rain annually. A full seventy-one minutes long, nearly all of *La Selva*'s transitions are moderate-to-subtle. The materials are rich and consistently startling, and are combined and melded masterfully. Ultimately, *La Selva* is significantly greater than the sum of its seventy-one minutes.

López has structured his materials to follow a twenty-four hour sequence, starting and ending at night. As he says, this is a *compositional*, rather than a 'natural' decision, and "*La Selva* has been conceived and created musically." [92] With this statement, Francisco López firmly answers a question implied by Barry Truax in the last clause of the long quotation in the second paragraph of section 1.6.2, above. For all that *La Selva* would seem to many to be 'a documentary field recording,'—in the singular—it is indeed instead the meticulously crafted result of hundreds of compositional, which is to say *musical*, decisions.

Elsewhere in the essay, López expounds at length: "I consider La Selva to be a piece of music, in a very strong and profound sense of the word… it's obvious I'm not attaching to the classical conception of music… This doesn't mean an absolute assignment of sounds to music… Instead, it refers to my belief that music is an aesthetic perception/understanding/conception of sound. It's our decision… [which] converts nature sounds into music. We don't need to transform or complement the sounds. Nor we need to pursue a universal and permanent assignment. It will arise when our listening moves away from any pragmatic representational 'use', and I claim for the right to do so with freedom." [93]

Further, López discusses his working methods as "sonogenetic composition," a composing which is guided by the sound of the material itself. This way of working, he says, "is one of the most fruitful and substantial forms of what I call the cooperation with the machines, that is, the interaction of so-called reality with non-cognitive, gathering machines—with sound recorders." He contrasts traditional methods of developing and structuring materials with the sonogenic method, saying that one might have "compositional ideas of structures or pre-existing canons [which guide] what you want to do with a composition that might come from musical structures or theory or taste, or a certain idea or structure that relates to some of the ideas that the composition is about. Those two things are very common. And then, any materials you have, if you use recorded materials, then you place those materials into that framework. So there are two different realms—one is the framework that you have, and then there's the material that you put into the framework. For me, the framework unfolds from the material. So, in that sense it's sonogenic." [94]

This direct investment in the actuality of the phenomenal sonic material is a constant theme in López's discussion of his working methods and attitudes toward art. He adamantly does not endorse the idea that a recording of a soundscape is a representation of a place or an indicator of a collective group

of sound sources, living, geographical or climatic, while allowing that it is one way that people regard the material. The following passage, under an epigraph from Magritte—'This is not a pipe.'—(with a nod and a wink), is a lovely and simple summation of this idea, speaking of *La Selva* again: "The richness of this sound matter in nature is astonishing, but to appreciate it in depth we have to face the challenge of profound listening. We have to shift the focus of our attention and understanding from representation to being. Or, in other terms, we should be free to do this. When listening to this CD, I hope you will desire to be there, in La Selva, but I also—and especially—hope you will be amazed to be here, in *La Selva*." [95]

1.7 The Field as a model for electroacoustic music

> As I worked in my West-side apartment … I could hear all the river sounds—the lonely foghorns, the shrill peremptory whistles—the whole wonderful river symphony that moved me more than anything had before.
>
> —Edgard Varèse (1966) [96]

1.7.1 Introduction to the Field, with etymological study

Having completed the journey from nineteenth-century Western harmony to the soundscape, we may now consider that which lies ahead rather than things of the past. It is amply evident that we are now free to use any sounds, to posit layers of differentiated textures uncoordinated by metric rhythms, and to proceed in improvisational multidirectionality. Subsequently, we wish to propose the idea of 'the field' as one possible conceptual framework within which to conceive of our efforts at the composition and analysis of soundscape composition, or, indeed, electroacoustic music generally.

Field is a very old word. *Chambers Dictionary of Etymology* has *field* "developed from the Old English (about 725) *feld*." [97] In contrast to this, the *Oxford English Dictionary* identifies the word's roots going back

approximately to the ninth century, as cognate with Old Frisian *fjild* and Old Dutch *felt*, respectively. These carried with them various senses, such as "'open country, field of battle, agricultural land.'" Later, Middle Dutch added to these "'open space in a town, area of space in a book, square on a chessboard, surface of a shield on which a charge is displayed.'" In modern Dutch, *veld*, we see the word take on modern ideas, such as "'area in which something operates (e.g. a magnetic field)'." The modern German *Feld* adds to these 'side of a die.' The *OED* entry text states that the "original sense of the word appears to have been 'open country' (attested in all the earlier stages of the West Germanic languages), i.e., land unencumbered by obstruction, as contrasted with forest, hill or marsh." Regarding current usage, the *OED* sense A.I2a(a) of *field* is "A piece of open land which is used, or has been designated to be used, for a particular purpose (originally and still predominantly agriculture, as pasture or crops), and which is now usually marked off or bounded by hedges, fences, boundary stones, or the like."[98]

Building on the etymological sense of a field as a topological feature and elaborating it as distinguished from other topological features (e.g., forest, hill, marsh) by its population with grasses, wildflowers and other low plants and a shifting, opportunistic and mobile aggregation of various vertebrate and invertebrate fauna, our field is bounded, occupied, geographical, active, improvisational and inclusive.

1.7.2 The Field, as a model

In the section above, the field under discussion is an actual, physical field, per the etymological description, which one might run across anywhere if one is lucky.[99] In this section, we will discuss this actual, physical field in terms of its attributes and their potential usefulness as a model for electroacoustic composition. Here, we will be using the term 'model' in the *OED* sense A.II11a, "A person or (less commonly) a thing serving as an object to be copied or depicted by an artist, sculptor, etc.; a

person employed to pose for this purpose."[100] This field is our "person or… thing" sitting to have its likeness interpreted. It is the object of regard whose attributes suggest ways of proceeding.

Our field is, perhaps, bounded by woodlands, a farmstead and a road. This boundary is per our definition (above), as well as per convention; one typically finds a field bounded by such things, as well as field stones, fences, &c. We will find these boundaries useful in application. They suggest a certain, incomplete degree of containment: mostly containing of our population of flora (although often not their seeds), but mostly ineffective with the "aggregation of various vertebrate and invertebrate fauna," hence their description as "shifting and mobile," being able to migrate in and out of the field largely at will. As a bounded area the field has its own geography, which is utilized by the population to aid in their success.

Within our field, there is ceaseless activity: the invisible nitrogen cycle; the growth of shoots, roots and rhizomes; the mostly unseen movement of worms, insects, amphibians and reptiles; the somewhat more obvious activity of birds. All of these agents appear to be acting separately, with each improvisationally performing its nature, yet all activity works together to contribute to and activate the total functioning of the field. The field is, after all, an ecosystem, defined in the *OED* as "a biological system composed of all the organisms found in a particular physical environment, interacting with it and with each other."[101] Its ecosystematic nature—with each individual actor working separately to activate the whole—is a crucial aspect of this model.

1.7.3 The Field, as a compositional framework

In this section, we will apply the model of the field, outlined above, to compositional activity. Here, like the boundedness of the physical field, the boundaries of our sonic "field" (or, henceforth, Field) are delineated as well, in this case by the receptive reach of our recording devices, or the sonic reach of our

playback systems. In the case of recordings, the recording input devices—such as microphones, hydrophones (microphones for underwater recording) and contact mics[102] (which pick up physical vibrations through direct contact), &c.—all have varying, limited ranges, which define the horizon or borders of our Field. And in the case of an existing soundscape or electroacoustic composition, the borders of our Field are the dimensions of the space reached by our headphones or loudspeakers, the perceptual boundaries—*vis a vis* the work—of the listening subject. By these means, the Field loosely circumscribes a perceptual area containing a potentially rich simultaneity of events or activity.[103]

The composer's purpose, then, is to set into motion their chosen population of voices: sonic species/agents/actors; these will proceed, make their improvisational decisions or turns according to their natures and without ostensible coordination. The Field, as the sonic ecosystem, contains and includes all that is happening, and all that happens composes what the Field is, what it becomes. The voices will utilize the geography of the field and its permeable boundaries which permit the possibility of migratory change: the various actors may come and go as desired. The ecosystematic nature of the Field assures the cohesion of the whole.

Given the inclusivity and permeability of the Field's geography and the improvisational nature of the procedure of its numerous denizens, the composer is managing a number of unordered agents/voices/sound objects, essentially curating, as it were, a database of elements through entrances, transformations and exits via various framing devices—mixing, filtration, &c.[104] New media and digital culture theorist Lev Manovich describes this database organizational logic: "[since] the world appears to us as an endless and unstructured collection of images, texts, and other data records, it is only appropriate that we will be moved to [work with] it as a database. But it is also appropriate that we would want to develop poetics, aesthetics, and ethics of this database."[105] Manovich continues,

observing that for any given database, "if new elements are being added over time, the result is a collection, not a story. Indeed, how can one keep a coherent narrative or any other development trajectory through the material if it keeps changing?" [106]

1.7.4 Other people's Fields

The attributes of the Field—its bounded, populated and inclusive/cohesive nature; the heterogenous and improvisational nature of its agents—are amply evident in examples from the recent literature. Here, we will examine two such compositions.

German composer Christina Kubisch (b. 1948), in her *Über die Stille* (1998), gathers a variety of mechanical and electro-mechanical sounds from various computer hardware. This constitutes, as she says, "the sound material which characterizes our acoustic environment at the end of [the twentieth] century: computers, hard drives, printers, mouse klicks [*sic*], CD-ROM drives, etc." [107] These Kubisch sets off to play their parts according to their natures, distributed across the stereo space. The voices are uncoordinated and yet cohesive, creating a unified composition drawn from a database of closely-related sounds. The twelve voices in this piece were originally part of a large installation work of the same title at Orangerie Schloßpark in Donaueschingen in 1997. There, the voices were distributed to twelve speakers, heightening the effect of geographic dispersal across the field of the installation space.

The title *Über die Stille* translates to the English *On Silence*. The thesis of Kubisch's accompanying essay, "Uber de Stille 1997" [108] is that in late nineteenth-century Europe, amid growing concern around industrialization, the devastation of nature and the loss of actual silence, natural sounds became associated with the idea of silence. When the human world ceased striving and went to sleep, the sounds of nature were what was left, and this was equated with 'silence.' Moving ahead to the very late twentieth century, the sound of computer hardware becomes an abject, contextual sound, ignored and hence the

sound of our contemporary 'natural environment.' Thus, *Über die Stille* is the new sound of silence at the verge of the twenty-first century.

In *Chaos & the Emergent Mind of the Pond*, American composer and acoustic ecologist David Dunn (b. 1953) gathers the sounds of underwater insects from freshwater ponds in North America and Africa and composes them into a shapely and sonically startling twenty-four minute soundscape. The unexpected "buzzing, clicking, whizzing and whooshing"[109] make for fascinating and unexpected textures. In his liner notes, Dunn describes the sounds as "shocking. Their alien variety seems unprecedented, as if controlled by a mysterious but urgent logic. The minutiae which produce these audible rasps and sputters remain mostly unseen amongst the tentacles of plants and layers of silt but each contributes to a sonic *multiverse* of exquisite complexity."[110] Again we have a composer curating a database of closely related sounds—closely related both sonically and conceptually—and setting them into the stereo space to be what they are and do what they do, which is to perform separately/together to create their sonic ecosystem. They are again ostensibly uncoordinated and yet cohesive.

Formally, *Chaos & the Emergent Mind of the Pond* is surprisingly symmetrical and elegant, a satisfying A-B-A construction which contrasts nicely with the chaotic vocabulary. The form is clearly perceptible, even over the nearly twenty-five-minute length of the piece. This constructivist approach to form contrasts sharply with that of *Über die Stille*, which seems to emerge more directly from the procedures of the voices than from any direction by the composer.

1.7.5 Field finale

In each case above, the Field is an eminently suitable model with which to describe the composition. Both exhibit the Field's tendency toward database procedural logic, resulting in a selection of voices from an unordered group at the composer's disposal. They both also exhibit the improvisational agency

of their respective voices, each of which proceeds appropriately to its nature, dispersed throughout the inclusive geography of the Field, without obvious coordination with the others and yet with each contributing to the unity of the whole.

This is to say that each of the aspects of our model posited above (see section 1.7.2)—a model based on the various aspects and workings of an ecosystem—holds true in these two works. Whereas Western art music up to the mid-nineteenth century proceeds according to various logics—those of melody, harmony and metric rhythm—thereby modeling a human trait, the Field locates the model for procedure in an aspect of the world, positing the world, not the human, as the appropriate precondition for human activity.

CHAPTER 2 – PORTFOLIO OF WORKS

2.1 Aldrich • Ingalls • Moazzeni • Norton • Ross: *11-6-2016* (Fall, 2016)

Figure 2.1 Aldrich • Ingalls • Moazzeni • Norton • Ross: *11-6-2016* cover art.

In mid-October, 2016, I traveled to McGill University, Montreal, QC, as a visiting scholar, with Nate Aldrich and Duane Ingalls. Nate was presenting at the Northeast Connection symposium that week; Duane and Anoush Moazzeni (traveling from Quebec City, whom we met up with at McGill) and I were there to work as expert instrument users/players with McGill doctoral students doing instrument design research at the CIRMMT research center.

Later that week, the four of us were allowed into the enormous black box space at CIRMMT, where we conducted a rehearsal session. While the rehearsal was musically successful, the documentary

recordings we made were not of sufficient quality for release, so we planned to reconvene in Orono in early November in order to attempt a more fully-appointed recording session at the University of Maine IMRC Center's AP/PE Space, adding Leslie Ross on bassoon and with Duane Shimmel engineering.

The resulting recording stands as a fine document of collective group improvisation, a method where individuals arrive at a situation to create together, quite possibly without having played together before (which was the case here), each prepared by their life experience up to that moment. They use this experience, as musicians and humans in the world, to inform their moment-to-moment decisions in response to the sounds arising from the ensemble in the unpredictably unfolding present. Fortunately, this time the recording was entirely of sufficient quality and brought to release via the meticulous mixing and mastering of Shimmel and Aldrich. The results can be heard here: https://spumusic2.bandcamp.com/album/11-6-2016.

2.2 *Be the material* (Fall, 2016)

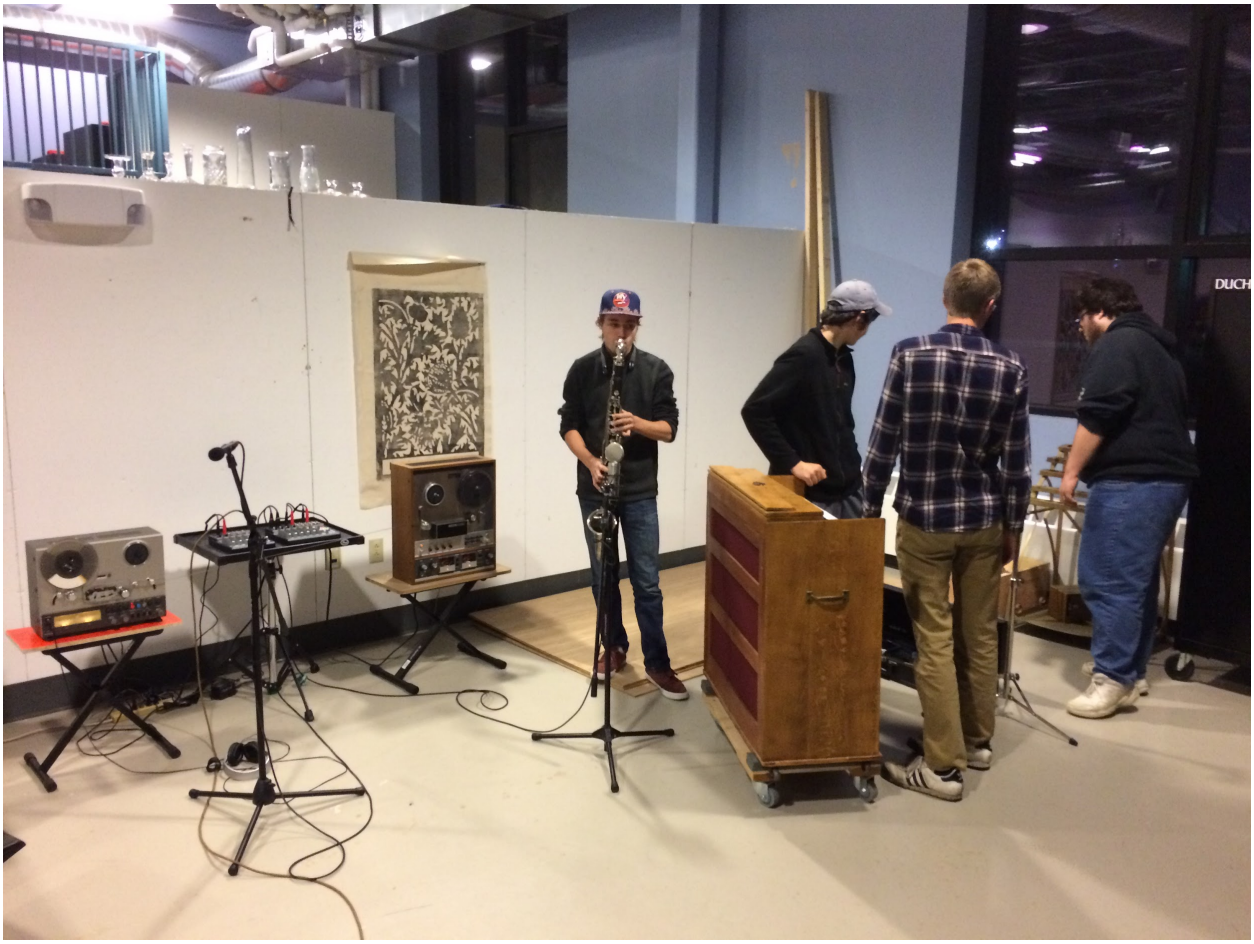

Figure 2.2 Electronic music composition students engaging the *Be the material* system. November, 2016.

Be the material is an audio system which provides for the creation of an indeterminate composition in real time by any participant or participants with a desire to join the process. Two tape decks with connected, open microphones and provided instruments comprise the system. The tape decks are configured as a delay system, where a single reel of tape passes across the heads of one deck, and then the other, being collected on the take-up reel of the second deck. The first deck is in record mode and receives input signals from the microphones. These are written to the tape and then passed to the playback head of the second deck after however much time is required for the signals to arrive, hence

the delay. (See diagram in figure 1.2, below.) In this system, the length of the signal delay time is calculable by the following formula:

delay length (seconds) = distance between heads (inches) / tape speed (inches/second)

The composition commences with the initial signal input into the system. These sounds are heard again after the delay period and, if other sounds are played into the microphones, these

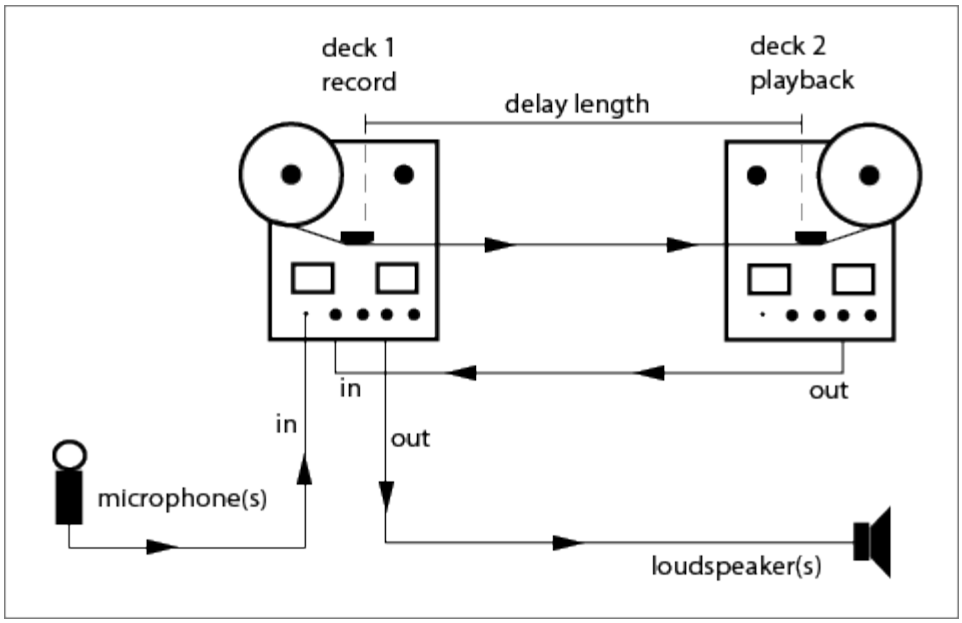

Figure 2.3. Diagram of the tape delay system for *Be the material*.

join many of the other sounds that have been played before them. The sounds repeat many times and eventually decay individually to silence, usually replaced by other sounds. All of this material is collected on the tape. When the tape runs out, the piece is over; further, it has been recorded onto the tape, and is available for playback.

The tape delay system used in *Be the material* was pioneered in the early 1960s by Terry Riley and Pauline Oliveros and others at the San Francisco Tape Music Center, and also independently in 1961 by Tony Conrad in upstate New York. Examples from this period are Terry Riley's album *Music for the Gift* (1963), Pauline Oliveros' piece *Bye Bye Butterfly* (1965) and Conrad's *Three Loops for Performers and Tape*

Recorders (1961).[1] Riley called the system the Time-Lag Accumulator. The technology became popularized in the early 1970s when Brian Eno introduced it to Robert Fripp; they used it to create the duo album *(No Pussyfooting)* (1973); this was followed two years later by *Evening Star* (1975). Also in 1975, Eno released *Discreet Music* on the very small edition but highly influential Obscure imprint (a subsidiary of Antilles Records). This simpler expression of the tape-delay system exhibited none of pop music aspirations of the Fripp and Eno material. It was arguably the beginning of Eno's highly influential series of recordings of what he called "ambient music," the notion of *Discreet Music* being an analog to French composer Erik Satie's idea of *musique d'ameublement*, or "furniture music," i.e., music which blends into its surroundings. (For more on this idea, see section 2.4.) Fripp then built himself a mobile version of the system, dubbed 'Frippertronics', which he used on Peter Gabriel's album *Peter Gabriel* (1976), Darryl Hall's *Sacred Songs* (1977) and his own first solo album *Exposure* (1979).[2]

In addition to the tape delay, the *Be the material* system is comprised of multiple open microphones and a handful of available instruments so that participants can come and go as desired, contributing to the progress of the collective composition for as long as they wish. This is a systematic compositional method, where the composer builds the machine, starts it up and then steps away (or joins in, again, as desired). Constructing music in such a way accomplishes two things. First, it renders the sonic content and morphology entirely indeterminate, constructed as it is by the improvisational impulses of an unknown and changing pool of participants. Second, it disperses and democratizes the compositional authorship, perturbing the cherished traditional notion of the composer as the singular, 'genius' author.

This piece was presented three times, in November and December of 2016. Due to the advanced age and semi-reliable nature of the equipment, the results were different each time. Were I to mount this piece again, an idea I would seriously entertain given the right context, I would invest in more reliable

tape decks. Because of its simple and clearly audible and visible procedure, this would be a useful piece to install in a place where the participant pool would include youngsters and people uninitiated in the concepts of experimental music.

2.3 *unintended consequences* (Fall, 2016)

Figure 2.4. *unintended consequences*, image example: Brown Brook, from the Airline at Aurora, Maine.

unintended consequences is a twenty-four-minute video work constructed from still photographs and field recordings. (By way of definition, field recording is the recording of sound outside of the recording studio.) The material presents sounds and images of intersections of the built and 'natural' environments. The sequencing of the photographs and sonic materials followed progressions intended to demonstrate the overwhelming of the natural environment by the man-made, built world. Most of the sonic material was collected via field recording at the same locations as the photographs and for about the first half of the piece, the sounds—those of nature as well as human-created—correspond to the photographs. As the piece progresses, the anthrophony, i.e., man-made sounds, consisting primarily of

traffic noise, intensifies to the point that it is quite loud by the end. This aspect of the piece is fictional; by the last third of the piece, much of the sound no longer corresponds directly to the photographs but is artificially intensified in density and amplitude.

While I am pleased with the quality and execution of the materials, I ultimately feel that the piece is unsuccessful. I have a list of changes I would make were I to attempt a v.2, but even with the corrections made, I don't think that the point being made is anything other than obvious.

Figure 2.5. *unintended consequences*, image example: Penobscot River Bridge at Brewer, Maine.

2.4 Erik Satie's *Vexations*: transcription & performance for three clarinets (Spring, 2017)

Since my first encounter with Erik Satie's *Vexations* (1893) in 2001, I had wanted to engage the piece again in a more direct way. I was finally prompted to do so in the Spring of 2017, upon reading the following text by Fluxus artist and co-founder Dick Higgins. This is from his essay, "Boredom and Danger" (1966): "...today [*Vexations*] is usually done by a team of pianists, and lasts over a period of 25 hours. Is it boring? Only at first. After a while, the euphoria... begins to intensify. By the time the piece is over, the silence is absolutely numbing, so much of an environment has the piece become."[3]

Vexations is a highly unusual piano piece, only a brief, single page long (see fig. 2.7 below), but with instructions to play this page 840 times. Since I play the clarinet, I arranged the piece for three clarinets (two standard B-flat clarinets and a bass clarinet) and recruited players from the music department at the University of Maine. I was very fortunate to be joined by music department chairperson Beth Wiemann and music sophomore Taylor Miedahl.

Because I had managed to secure only two other players, we would each have to play the entire time. Subsequently, I changed the rules from "repeat 840 times" to "play as long as you can," particularly since clarinetists succumb to fatigue far sooner than pianists do. One afternoon in mid-April, we set up unannounced in the lobby of the IMRC Center at the University of Maine and played for an hour and a half. We each took turns playing the repeating melody line which gave everyone a little bit of rest. The experience of performing the piece was indeed euphoric, as Higgins had said (above). I felt that after I got into the groove of playing, the specifics of the experience evaporated into the flow of the piece and of time itself. Afterward, I really did not recall any details of the playing.

Erik Satie (1866 – 1925) was an unlikely musical revolutionary, and yet he has been an inspiration for many 20th century composers, "discovered" and championed by John Cage, for one example. According

to Robert Orledge, Emeritus Professor at the University of Liverpool, Satie was "a colourful figure in the early 20th century Parisian avant-garde" and "a precursor to later artistic movements such as minimalism, repetitive music, and the Theatre of the Absurd."[4] He also invented the prepared piano, total chromaticism and developed the first coordinated film score.[5] He is well-known to many piano students as the composer of the gentle, subtle and technically tractable *Gymnopédies* and *Gnossiennes*. These fragile wisps of music seem to vaporise as they are played; they also relate to Satie's idea of *musique d'ameublement*—i.e., "furniture music," which is to say music which blends into the background of its environment, similarly to the way that furniture does. Satie developed this notion in 1920,

Figure 2.6. Performing *Vexations*, l. to r.: author, Taylor Miedahl and Beth Wiemann. April 17, 2017, IMRC Center, Orono, Maine. (photo: Eleanor Kipping)

presaging by almost sixty years the ambient music phenomenon begun with Brian Eno's *Music for Airports* (1978).

Although Satie composed *Vexations* in 1893, 27 years before developing the furniture music concept, it arguably has much affinity with the idea. Utilising total chromaticism—more than fifteen years ahead

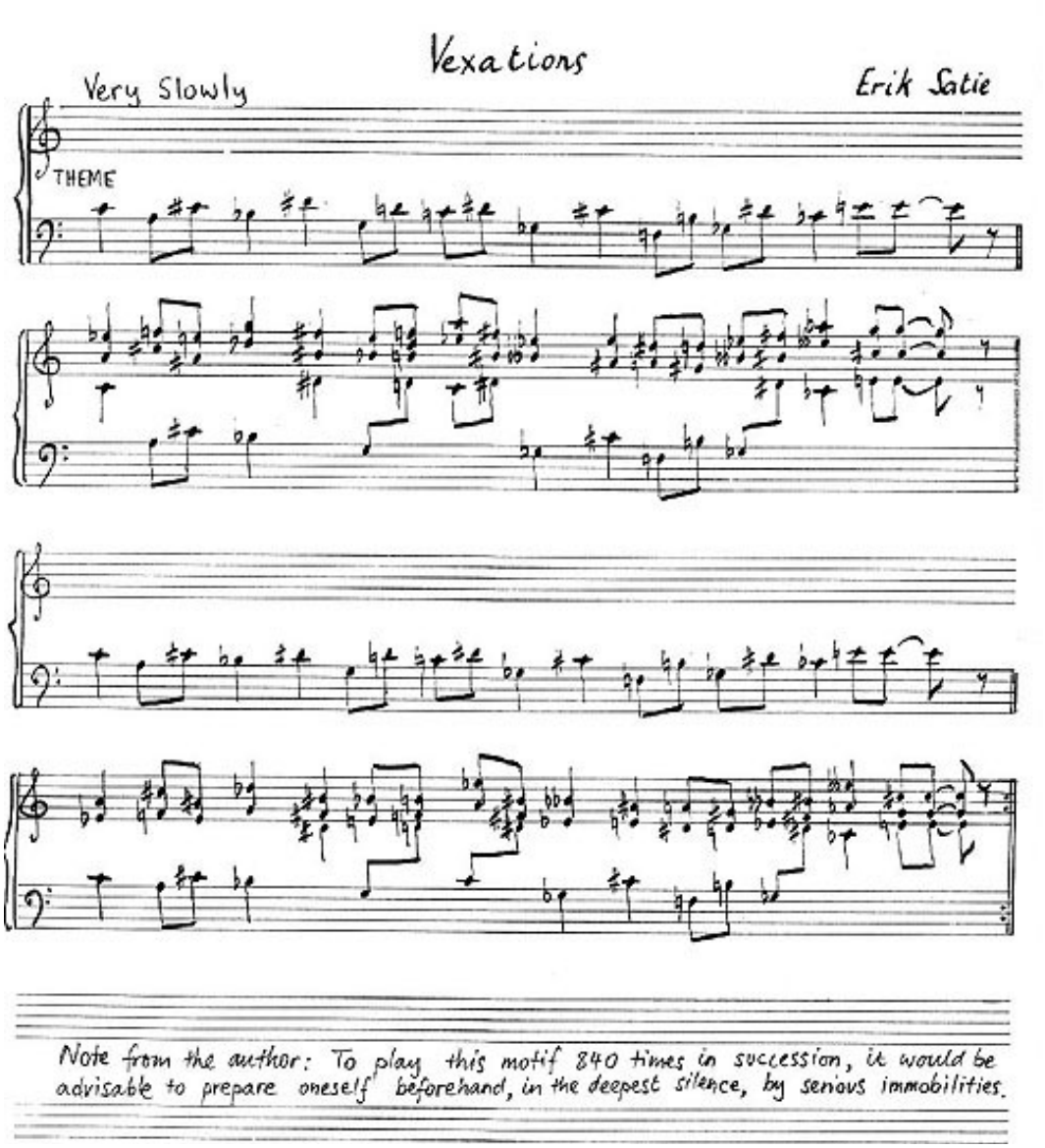

Figure 2.7. *Vexations*, circulated, handwritten, English-language transcription by Stephen Whittington of Satie's original manuscript.[6]

of the free atonality developed by Arnold Schönberg and his students—the musical material is melodically and harmonically entirely ambiguous. The piece consists of four systems each containing a single, repeated melody, which is harmonized by upper voices in every other iteration. Satie indicates that it is to be plated very slowly ("*très lent*") and repeated 840 times. The effect of this ambiguous material constantly repeated over a vast length of time (performances typically last from 14 – 24 hours [7]) is that it settles nicely into the background, and makes for a pleasant sofa or easy chair in which to undertake other activities. *Vexations* was unpublished during Satie's lifetime, but copies eventually made it into the hands of musicians and musicologists in the middle of the last century. The first significant performance was mounted by John Cage at the Pocket Theater in New York City in 1963. [8]

I first encountered *Vexations* in 2001, in the live radio broadcast of a performance mounted by the Music Department at Tufts University. I listened to it all day at work (via Web streaming), in the car during my evening commute, and, because we lived right nearby, after dinner I took my son up the hill to Tufts to see the performers playing the music. After that, I continued listening at home into the evening, even leaving it on quietly when I went to bed. This experience *vis a vis* a musical work was a singular one in my lifetime—never had one piece of music so inhabited and 'colored' the majority of a day for me.

2.5 Experimental Music Concerts: Cardew, Oliveros, Ono (Fall, 2016 and Spring, 2017)

In the Fall of 2016, Gustavo Aguilar and N.B. Aldrich (faculty members of the University of Maine, Farmington and the University of Maine, respectively) assembled a group of students to present a program of four twentieth-century compositions from the experimental music tradition. There were three University of Maine Intermedia MFA students (Alicia Champlin, Eleanor Kipping and myself) and five undergraduate music students from the University of Maine, Farmington. In October and November, 2016, we held rehearsals separately at our respective schools and also got together both in Orono and in Farmington to rehearse the full ensemble.

Figure 2.8. At the first of the Fall, 2016 concerts, Fernald AP/PE Space, IMRC, University of Maine, Orono ME. (photo: Jim Winters)

This was a great opportunity to experience first hand this literature with which I was mostly familiar only through reading. Each of these experimental works presents, in a concert setting, material which upends the virtuosity (i.e., technical unavailability to the average person) cherished by the concert music tradition, while maintaining its seriousness of presentation. Our program for the concerts follows:

Yoko Ono (b. 1933) – *Lighting Piece*
Yoko Ono (b. 1933) – *Secret Piece*
Cornelius Cardew (1932–1981) – *The Great Learning*, paragraph 7
Pauline Oliveros (1932–2016) – *Rock Piece*

We scheduled two concerts, one at each institution:

Tuesday, November 29, 2016 at the University of Maine
Thursday, December 1, 2016 at the University of Maine, Farmington

In a particularly poignant turn, Pauline Oliveros passed away at the age of eighty four on November 24, 2016, while we were in the midst of final preparations for the upcoming shows. She had visited the Intermedia MFA program as a visiting lecturer only a year prior, on November 17, 2015. Her passing lent a palpable gravity to the concerts, which were dedicated to her memory.

The following spring, 2017, Aguilar and Aldrich responded to a call from the Portland Conservatory for participants in the 2017 Back Cove Festival of Contemporary Music held in early April in Portland, Maine. They chose to reconvene the graduate student portion of the group for this opportunity and present a memorial program of four pieces by Pauline Oliveros. We were joined by Gaelyn Aguilar, (faculty at U. of Maine, Farmington) and also, just for *Sound Piece*, by Ryan Wilks (undergraduate musician, U. of Maine). The festival was held at the Portland Conservatory on Saturday, April 8, 2017,

from 2:00 to 8:00 pm. Our program this time consisted of the following pieces, all by Pauline Oliveros:

"Tumbling Song" (no. XIV from *Sonic Meditations*)
"One Word" (no. XII from *Sonic Meditations*)
Sound Piece for amplified table, objects and instruments
Rock Piece

2.6 *No once in pastless now.* (Spring, 2017)

No once in pastless now. renders into sound the textual content of Samuel Beckett's *Worstward Ho*—a short prose piece and one of his last, from 1983. The piece is a composition for low clarinet and electronics. There is no intention to express the action of the prose, but rather to transliterate, as it were, the text into a performable piece.

Figure 2.9. Premier of *No once in pastless now.* Author (l.) and Joshua Couturier (r.). May 28, 2017, Fernald AP/PE Space, Orono, Maine. (photo: Amy O. Pierce)

Worstward Ho is Samuel Beckett's penultimate prose piece (followed only by *Stirrings Still* (1986–89)). *Worstward Ho* is a mere forty short pages long, but its sustained, haunting (and haunted) tone and pessimistic cast make a strong impact which is all the more effective in that it can be read in its entirety in a single sitting. These were the aspects which made me want to make a sound performance piece

which would translate/capture the tenor of the text. The text describes the actions of four entities, collectively referred to as "the three" by Beckett[9] because two of the entities, an old man and a child, effectively function as a single unit. They exist in a (non)place described as a ("missaid") "narrow void"[10] which is continuously lit by "the dim", a wan light emanating from a "sealed… pipe or tube".[11] Almost nothing actually happens in the course of the text. Certainly, no action is actively taken by the entities. The old man and child are said to walk continuously, hand in hand; however, they never appear to go anywhere. According to Beckett, they "plod on and never recede."[12] Positionally, the other two—an old woman and a staring, skull-like "head sunk on crippled hands"[13]—are static. The old woman, initially arises to stand, and later kneels; the head seems to sit. The 'narrative drama' in *Worstward Ho*, or what little there is, is a slow process of degradation of the situations and personages of these entities and, indeed, of the entirety of the semantic content of the text. Literary theorist Pascale Casanova describes this continuous worsening as 'pejuration,' in her book on Beckett's literary methodology.[14]

I chose my title—'*No once in pastless now.*', a sentence from Beckett's text[15]—for its congruence with sound theorist Salomé Voegelin's idea of the intersubjective production of the sonic performance: "Hearing does not offer a meta-position; there is no place where I am not simultaneous with the heard."[16] She notes that our apprehension of sound occurs *in* our bodies, sound being a material (sound waves) which touches our eardrums. Consequently, and unlike seeing an object at some distance or remove, our objective distance from the site of sonic production is zero, which leaves us temporally in a continuous present, a "pastless now."[17]

To create the structure and elements for *No once in pastless now.*, I made inferences from *Worstward Ho*, with no intention of providing any sort of representational gloss thereupon. My goal was to make a generally performable piece with minimal staging requirements beyond the audio technicalities. To

translate this textual material into sound, I analogised the text to workable musical terms in order to create a performable musical composition. The distinction here between making a dramatic piece which attempts to express Beckett's narrative and rendering or transliterating textual material into sound material is an important one, a difference of intent and method. My focus was on material rather than meaning. Instead of attempting to compose music which rendered some kind of expressive textual representation, I read and reread the text in search of sonic opportunity.

For the overall temporal structure for my piece, I chose the length of time to read the text which is approximately forty minutes. Analogising from the textual materials, I chose four voices which correspond to Beckett's "the three" and "the dim". Since "the dim" is a light emanating from a tube, I selected a 60 Hz hum, as would be heard from a failing fluorescent light. And in a single nod to staging, I used this as an opportunity to light the performance area. In the text, the dim light is the one thing that bounds existence. Beckett's narration has 'the worst' as its goal, and is steadily pejurating all of the elements in the narrative. But while the elements are continuously worsened, they cannot be eliminated (the worst!) until the dim is gone. Therefore, *No once in pastless now.* begins and ends with the turning on and off of the fluorescent light and a 60 Hz tone, generated electronically. (In recent performances of the piece, the 60 Hz hum—formerly made with an oscillator—is generated by a photodiode pointed at the light. This more congruently wraps together the sound and its putative source.)

A looped recording of two regular rhythms corresponds to the old man and the child forever plodding on together. These are of similar but not exactly the same tempo and so continuously go in and out of phase with each other. The old woman, a static figure, is analogised to a droning pitch with a slight, slow waver generated by an oscillator. These two voices come in and out corresponding to their presence in or absence from the text, where they seem to flicker in and out of existence. (Or

consciousness—see immediately below.) Beckett has them "sudden gone sudden back," (see p. 15, e.g.) although it seems clear that this is not by any agency of their own.

The figure of the "head sunk on crippled hands" is one of the most ambiguous elements in the text. Is this the narrator? Is Beckett the (omniscient) narrator? The head is described as "Seat of all. Germ of all."[18] Given this position, the piece needed an element corresponding to the text itself. To do so, I abstracted the rhythmic structure of the text, as one would analyze the meter a poem: short long short long long, &c. I assigned this part to the low clarinet, which I would play—the clarinet being a wind instrument, and in this case in a metaphorical relationship with the quasi-narrative voice.

I have been surprised and pleased at how well-received this piece has been. As of this writing, it has been presented six times, in Maine and Massachusetts: four in the original, abridged version (twenty minutes long), and, most recently, twice in its full, forty-minute entirety. The work is far more successful in its full-length version; because it is a sort of minimalism, it benefits by being allowed to settle into its groove and stay there for an extended period, recapitulating the effect of the text itself.

A recording of the premier performance can be heard at the link below; note that this is the abridged, twenty-minute version of the piece: https://soundcloud.com/senorton/no-once.

2.7 Improvisation with field-recorded sound, w/ Michael Rosenstein (Summer 2017, ongoing)

Figure 2.10. author (l.) and Michael Rosenstein (r.), performing in Somerville, MA, August, 2017. (photo: Sam Laviazar)

To one degree or another, I have been involved in field recording since January, 2009, when I first acquired a hand-held, flash-memory-based digital audio recorder. My engagement in the practice has ebbed and flowed over the years, but gradually built in intensity. During the Summer 2017, I designed a course of field study covering the history, literature and techniques of field recording, including some instrument building. This was primarily based in Boston, so that I could collaborate on the project with my long-time friend and colleague, Michael Rosenstein. Michael had then recently been bitten by the 'field-recording bug' and dived in enthusiastically. His approach and mine differed substantially, which led me to believe we would have much to learn from each other. We shared books, recordings, sound files and input devices (i.e., microphones, piezo and electrocoil pickups, hydrophones, photodiodes, &c.)

and spent time wielding soldering irons in Michael's basement. We embarked on sound-gathering expeditions in Boston, Massachusetts, and Bangor, Brewer and Orono, Maine.

From the beginning of the project, we determined that the final outcome would be a concert where we improvised by choosing and combining our pre-recorded sounds in live performance. This practice would require us to regard our materials as 'sound objects' in the *musique concrète* sense defined by Pierre Schaeffer (see section 1.3.2, above), choosing them primarily for their phenomenological properties and manipulating them to taste. To that end we booked Saturday evening, August 26, 2017, at the Washington Street Art Center in Somerville, Massachusetts, for our performance date.

Later, in the Fall of that year, we brought the performance up to the University of Maine, playing in the Graduate Space at the IMRC on November 30th during a graduate student event. This has become our standard mode of performing together, with further performances happening in Worcester and on-air radio performances in Worcester and Newton, Massachusetts, in 2018 and 2019. These performances are all freely improvised utilising our individual databases of field-recorded sound as material and change they significantly from one concert to the next.

A recording of our August, 2017 performance can be heard at the following link: https://soundcloud.com/michael-rosenstein/steve-norton-michael-rosenstein-at-wsac-8-26-2017.

2.8 Improvisation with Luciano Chessa (Fall 2017)

Figure 2.11. L. to r.: Luciano Chessa, Jim Winters, Steve Norton. (photographs: Amy O. Pierce)

Italian-born composer, performer and musicologist Luciano Chessa visited the Intermedia MFA October 17, 2017 as a visiting artist. For his presentation, he wished to give a concert, and asked the faculty to provide him with accompanying performers. Jim Winters and I were invited to join him in an improvisation. Luciano had very specific opinions regarding instrumentation, and asked Jim to play hurdy-gurdy and asked me to play celesta. He also asked for percussion instruments to play, as he had not brought an instrument with him. Jim provided him with a large steel sink, and I brought him my concert bass drum.

As happens in the world of free improvisation, this was a performance where at least one of the players had never met or even heard of the other two (and *vice versa*), and yet the playing was simpatico and the results unique and, to these ears, satisfying. Jim Winters recorded and mixed the performance

and posted the resulting document on Soundcloud. This performance can be heard here: https://soundcloud.com/james-winters-525579275/proto-lc.

2.9 *THIS IS ALI ASGAR'S HOME* (Fall 2017)

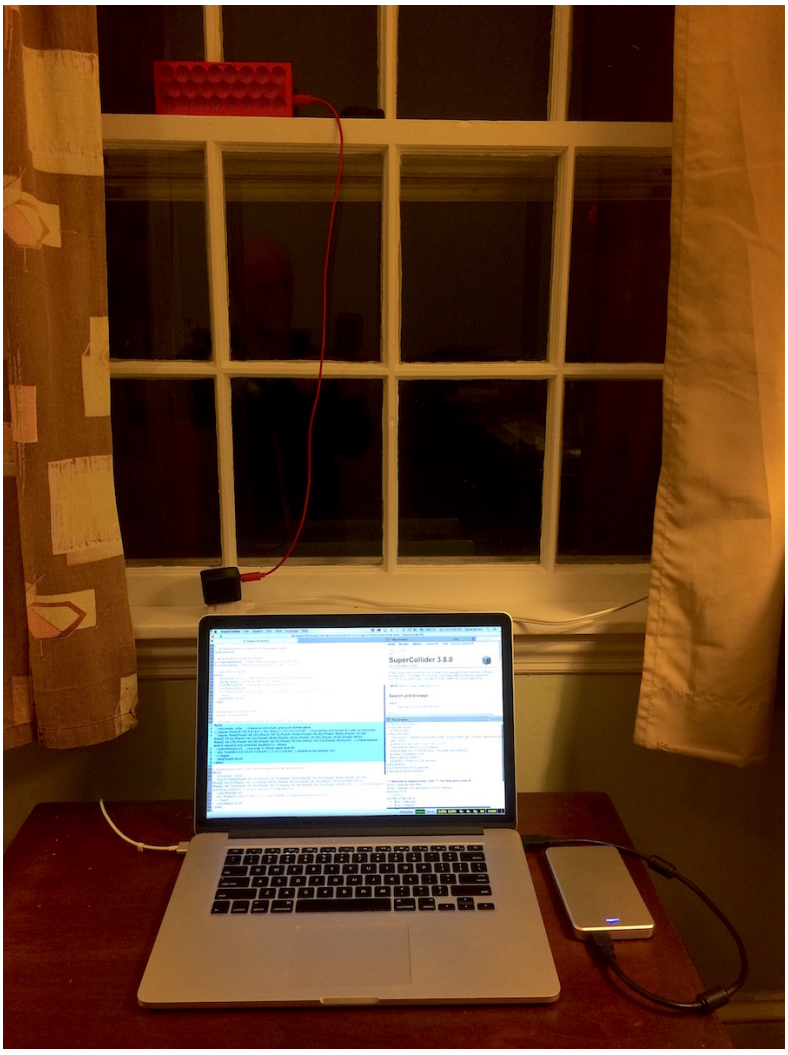

Figure 2.12. Image from a later iteration of the piece, showing the whole apparatus. Setting similar to premier installation.

In the Fall of 2017, artist Ali Asgar mounted a pop-up show at his house, inviting artists to specifically utilize his entire apartment however they saw fit. There was a variety of visual, installation and performative work presented; remarkably, the works all fit the space in ways which made room for all the other work. My work, entitled *THIS IS ALI ASGAR'S HOME*, is an electronic music work intended to add subtly to the domestic environment at Ali's home, for the duration of the show. The letters in the

title are mapped to pitches in a musical scale from the Indian subcontinent. The pitches played sequentially and asynchronously in two voices of contrasting timbres (i.e., sound qualities). Each event can be a note or a silence, and the durations of these are randomized. I built this piece in a programmatic music environment called SuperCollider, which allowed me to alter various parameters of the sounds while the piece was running. So during the evening, I would periodically go to my computer and change pitch compasses (i.e., which octave(s) the pitches would occur in) and duration ranges of the voices via manipulation of the code. These changes were made arbitrarily, for the sake of variety.

The show itself was titled *Gross Domestic Product*, and ran the afternoon and evening of November 11, 2017. Other artists showing work were Aylah Ireland, Eleanor Kipping, Lisa Leaverton, Susan Smith and Virginia Valdes. Each artist's work was entirely distinct in medium and message.

2.10 *Shine on us* (Fall 2017)

Figure 2.13. Sunset from the summit of Chick Hill, Clifton, Maine, October 21, 2017.

Shine on us is a piece of *musique concrète* (see section 1.3.2, above) which I created in the Fall of 2017. The previous summer, I had studied *Lux Aeterna* (1966), an *a capella* choral work for sixteen voices by Hungarian composer György Ligeti (1923 – 2006), analysing its form and considering its potential as a pattern for a composition of my own. Being *musique concrète*, it is made up of pre-recorded sound. In this case, the sounds are gathered from the natural or built environment, a practice known as field recording.

Because I was using *Lux Aeterna* as a template, my composition consists of sixteen voices of sound gathered to align with the topics of 'light,' 'Lord,' 'saints' and 'rest.' These are the topics from the text

which Ligeti set in *Lux*—a section of the Latin requiem mass. I collected my material using audio microphones and photodiode sensors, which convert light into audio signals within the range of human hearing. I then placed the topical material into its locations corresponding to the 'map' made from *Lux Aeterna*. The human voices audible in the piece correspond to the 'saints,' as an example.

In order to properly frame my work on this piece, I did extensive research on György Ligeti and his work leading up to *Lux Aeterna*. This ended up in a paper which I intend to revise and post. Until then, the material is available upon request. The recordings were made in October and November, 2017, at locations in Boston, Massachusetts and Clifton, Eddington and Orono, Maine. The composition was completed in December, 2017, in Orono.

Shine on us. is available for audition at: https://soundcloud.com/senorton/shine-on-us-v1.

2.11 *Coincident System* sound installation (Spring 2018)

Installed in my home for presentation, *Coincident System* is a three-channel sound installation presenting an indeterminate electroacoustic composition. The installation consists of three speakers set in the house as far apart as possible from each other. Each speaker presents a recording of a different take (performance) of a highly structured improvisation. The three takes begin simultaneously, but slowly fall out of phase or synchronization with each other due to their slightly varying lengths. Each speaker is audible throughout the location, albeit at varying levels depending upon where the listener is situated. The ability to move throughout the space affords the listener the opportunity to "mix" their own experience. None of the speakers are visible from the vantage point of either of the others. Visiting them all requires walking the length of the house and climbing stairs, as the geographical metaphor implicit in installation work is fully in play here.

Figure 2.14. Three speakers in place for *Coincident System*: east, north and west.

The natural and social worlds are complex networks of coincidentally proximate systems, interacting to varying degrees—sometimes simply juxtaposed in space and time, and sometimes fully feeding back upon one another; this piece takes its inspiration from those ideas. It is also a nod to Steve Reich's phase pieces and Brian Eno's work with asynchronous loops. And further, it is a tribute to my favourite improvising reed players—Roscoe Mitchell and Evan Parker, for instance, and an experiment in taking material rooted in that sound-world and structuring it as a sound installation.

I made no recording documenting the piece *in situ*, and am dubious regarding the potential for success that an attempt at such a recording would hold at any rate. However, I did create a recording where I took five of the takes of the piece and stacked them up and panned them across the stereo field.

This fixed media version can be heard here: https://soundcloud.com/senorton/coincident-5x-fixed-relationship.

2.12 *Requiem* (Spring 2018)

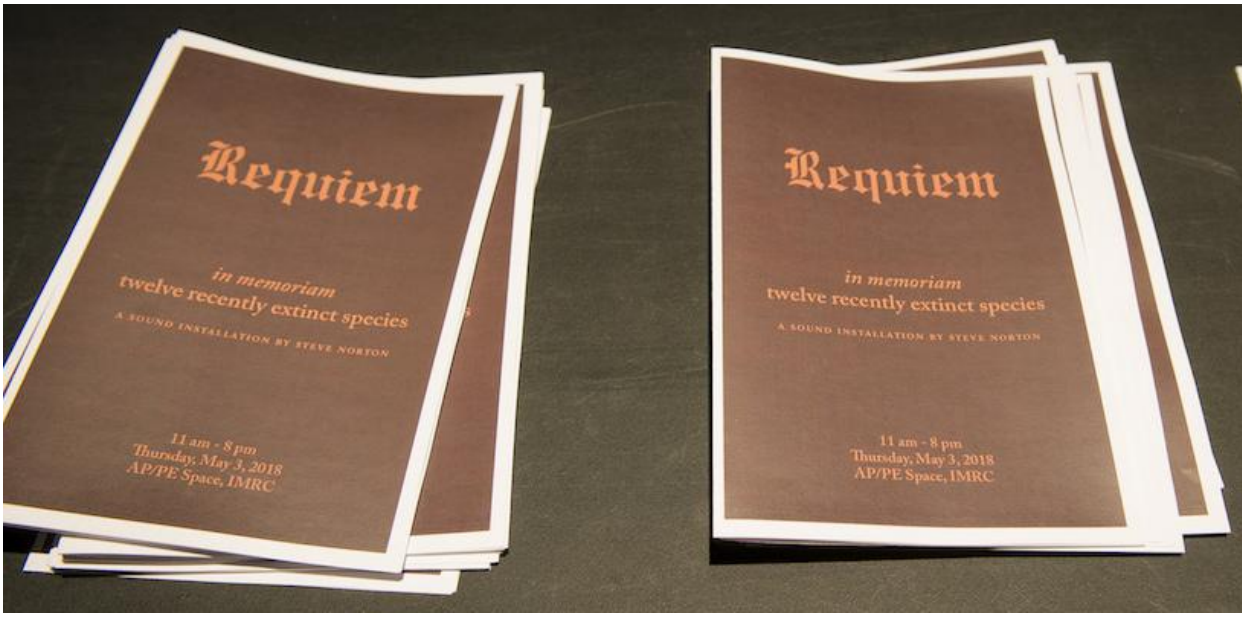

Figure 2.15. The program booklet for *Requiem* contextualizes the sound for listeners. (photo: Jim Winters)

Requiem is an electroacoustic music composition whose topic is human-driven extinction and whose sound materials are exclusively the sounds of ten birds and two frogs—twelve species which have gone extinct during the era of recorded sound. *Requiem* enables us to hear them once again, *ad aeternum*. This is a unique moment in the history of life (and death) on earth, and the beginning of a new era.

Requiem is presented in a visually minimal fashion, ideally utilizing just four speakers in a dimly-lit room; this is intentional, and is a means to focus attention on the sounds of the piece. Although *Requiem*'s formal structure is perceptually indeterminate, mimicking the processes of nature, the reality it presents is fictional, juxtaposing species most of whom never coexisted in time and space. This play of reality and irreality mirrors the nether state of the recently extinct, where, in many cases, humanity is unsure whether the species is actually gone for good or if a tiny population is holding out somewhere,

undetected. In the words of technology and society researcher Joeri Bruyninckx, they are "suspended between survival and extinction."[19]

With regard to genre, *Requiem* engages acoustic ecology, a practice which uses soundscape composition to explicitly foreground environmental and ecological topics and issues. It grew out of the work of R. Murray Schafer, et al., who developed the ideas of soundscape recording and soundscape composition in the late 1960s and early 1970s. (See section 1.6, above.)

During a recent discussion with historian Michael Lang,[20] we reflected on his thoughts regarding 'ancestor worship,' in the sense of engaging in serious thought about and appreciation for one's forebears and their sacrifices and efforts which actually provide for the present one is experiencing now. Such reflection lays out a threefold, generational sense of time: first, pastward, in the remembrance of these persons and regard for their accomplishments and sacrifices; second, in the present, in that these remembrances establish the ancestors as present among those remembering; and third, projecting into the future, in the hopes and aspirations of those remembering for their own offspring and, perhaps, for all future generations.

We further discussed *Requiem* in this context; through this lens, the work can be described as having a similar threefold, generational relationship to time: it is pastward-looking and shares with the idea of 'ancestor worship' its reverent, commemoratorial tone; there is also a very present sadness on the part of the listener, who knows that for the creatures whose voices they are hearing, there are no future generations for which to hope or aspire. However, additionally to this temporal aspect of contemplation, there can potentially be added a horror on the part of the listener in the realization of their own complicity in the eradication of these extinct species, given that we (i.e., conquering Westerners) all

participate (whether unthinkingly, unwillingly or willingly) in the systems of commerce and economic expansion which have led to this destruction.

In the first two installations of *Requiem,* groups of middle school-aged students encountered the piece, accompanied by their instructors. This fulfills my primary hope for the work, which is to see it engaging people from outside of the art world, and particularly the young. Without expressing a particular agenda, the piece presents simple materials and factual information, encouraging the listener to draw their own conclusion. *Requiem*'s simplicity and directness has made it easily my most successful piece; it the first fourteen months of its existence, it has seen six different installations.

A ten-minute excerpt from a long recording made *in situ* in the premier installation can be heard here: https://soundcloud.com/senorton/requiem.

2.13 *field: snowfall* (aspect 1) (Spring 2019)

Figure 2.16. Site of the *field: snowfall* recording.

field: snowfall (aspect 1) is a continuous, unedited, thirty-minute excerpt of a long recording I made of a snowstorm in Orono, Maine, on January 20, 2019, in the backyard of my house. The composition was subsequently completed on January 27. It unfolds and proceeds very slowly but in that time, I believe, it amply rewards the patient listener.

For *field: snowfall*, I have captured several different sonic aspects of a given bounded space using a handful of different input devices (i.e., microphones, contact mics and/or hydrophones) and mixed among these 'voices' in the creation of the piece to accomplish the desired soundscape outcome.

This is essentially a 'found composition' in that there are no edits other than my choices of start and finish points. The coming and going of the rhythmic sounds of the snowfall reflects the occurrences as they happened. Granted, I have altered made sonic alterations in order to emphasize the lovely, indeterminate rhythm of falling snow. This complex, composite rhythm is the fundamental sound of the first and third section of the piece. The other sound, introduced in the second section, is the local soundscape comprised of wind in trees, birds, red squirrels, human snow-shovelers and a pair of snow removal trucks in a nearby parking lot, whose back-up chimes ping along at the coincidental interval of (roughly) a minor third.

Conceptually, *field: snowfall* is an excellent example of my concept of The Field (see section 1.7). By various methods,[21] I capture disparate sonic aspects of a circumscribed area; the finished work reveals this disparity as a harmonious whole. The "aspect 1" designation allows me to go back to the original recording (which is 5 hours and 20 minutes long) and select other portions to work with.

field: snowfall can be heard here: https://soundcloud.com/senorton/field-snowfall1.

2.14 *field: alarum, implication* (v.1) (Spring 2019)

Figure 2.17. Site of the *field: alarum, implication* recording.

In November of 2018, I participated in the Sonic Mmabolela residency[22] in Limpopo Province, Republic of South Africa, directed by Francisco López and Barbara Ellison—a two-week long, life-changing opportunity to sharpen one's field-recording skills, meet and learn from wonderful new people both local and from far away, and spend long, uninterrupted stretches of time listening to a world entirely different from what one is accustomed to.

field: alarum, implication (v.1) is the first composition I have made from the sonic material gathered during this trip. This piece is made from a short excerpt of a much longer recording gathered at the edge

of the Limpopo River, which forms much of the northern border of South Africa. In this location, we are directly across the river from Botswana, beside a pond-like eddy on the southern edge of the Limpopo.

Although the sounds in this composition were recorded first, on November 25, 2018, this is the second of my Field pieces, after *field: snowfall* (above). Here, I have gathered six channels of sonic input from a fairly circumscribed area of about three to four meters square using a handful of different input methods, which I will enumerate here:

1. a stereo pair of microphones to record the ambient soundscape (two channels)
2. a small mic in a hole in a rock wall which filters the ambient sound (one channel)
3. a contact mic in another hole in the rock wall, capturing whatever is crawling around inside (one channel)
4. two hydrophones in the water (each of different construction and sonic qualities), on whose surfaces tiny snails are heard rasping (two channels)

These six channels, the 'voices' in our composition, recorded simultaneously, create an aural 'snapshot' of this particular place at this particular time. The integrity of their temporal relationship has been maintained throughout the piece. In other words, at any moment, all the sounds that are sounding together were actually sounding together at the time of the recording. I did no moving around, time-wise, of any of these tracks (or portions thereof). I applied a few resonant filter effects to few passages in response to the sounds themselves, to intensify certain sonic qualities.

Together, even in their combined heterogeneity, these voices represent only a fraction of the activity happening in this Field. Yet they are all working together to make this particular system what it is, and what it will become. They are unconsciously but quite deliberately projecting this space, this small portion of the world, into the future.

I am pleased with this composition, but also aware that it suggests a potential which I had not yet realised. This piece can be heard here: https://soundcloud.com/senorton/field-alarum-implication-v02

CHAPTER 3 – THESIS PROJECT

3.1 *field: alarum, implication* (v.2) (Spring/Summer 2019)

Figure 3.1. Another view of the site of the *field: alarum, implication* recording. The concrete bridge heads north across the Limpopo River into Botswana.

Version two of *field: alarum, implication* begins with the same six tracks of sound, edited out of a longer recording, as version one described above in section 2.14. However, instead of mixing them down to two channels as was done in v.1, the six channels maintain their autonomy, with each being sent to its own speaker. The speakers are placed in a formation analogous to where the various microphones and hydrophones were situated in relation to the recorder and the recordist. In this way, the configuration of the inputs to the piece is then recapitulated in its presentation. (See figure 3.2, below.) These six

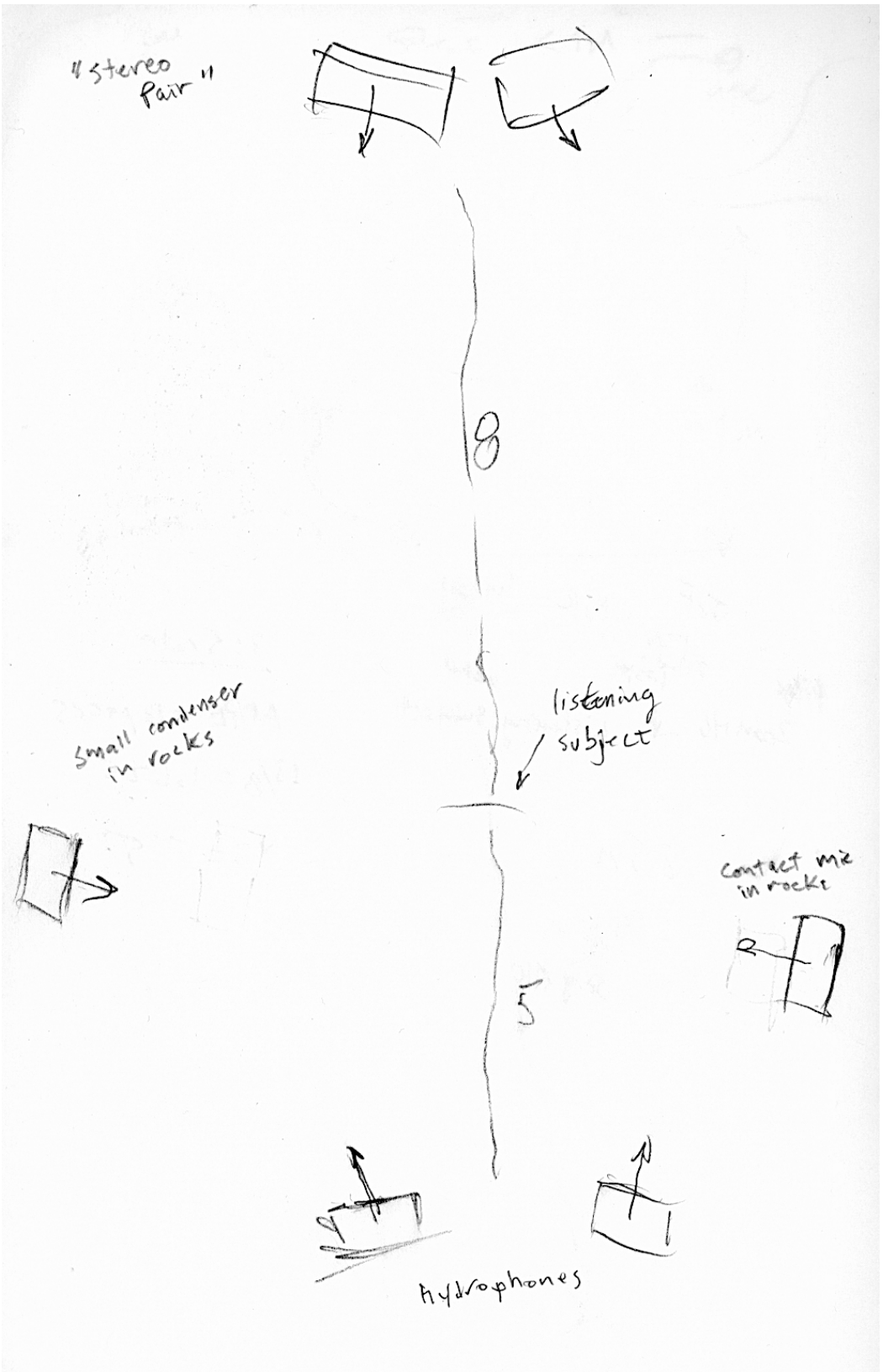

Figure 3.2. Diagram of speaker placement for the *field: alarum, implication* (v.2) installation, based on the placement of the microphones. Units are those of proportion, not distance.

channels become the six voices in the piece, analogous to the individual voices in a traditional musical composition.

The new presentation expands the piece in other dimensions as well. Material from the two hydrophone voices is altered and fed to two subwoofers.[1] This gesture reveals another aspect of the material, yielding further richness and filling out the frequency spectrum in the large room as the sub-basso of our choir of voices. Also, the speaker area is an expansion of the dimensions outlined by the

Figure 3.3. *field: alarum, implication* installation view. (photograph: Amy O. Pierce)

original inputs to the recording while maintaining their proportions; this gesture fills the presentation space and accommodates the audience. Further, several compositional gestures of version one were adjusted or replaced altogether to take advantage of the new presentation situation. For the listener, the

freedom to move about and explore the geography of a sound installation is a dramatic change from a flat, stereo presentation.

What the listener is hearing, then, is my experience and interpretation of one afternoon in a small area by, and in, the waters of the Limpopo River—the border of northern South Africa. Audible are a large number of birds, insects flying about and sometimes knocking into a microphone, tiny snails rasping rhythmically on the two hydrophones in the water, a chorus of incredibly loud cicadas, and a frog who begins to call at just the right time to take us to the end of the piece. Humans, as well, are heard in the composition.

One often encounters an aesthetic amongst makers or consumers of field recordings where the desire is for pristine recording, free of all human-generated sound, so that there are no traces of airplanes, cars or people. In *Notes from the Wild*, nature recordist Bernie Krause recounts the frustration of working with corporate producers who wanted their nature recordings "pure," demanding the absence of all anthropogenic sounds from their productions. As Bernie tells the story:

> Environmental paradigms of the 1960s, 70s and 80s… reinforced the *separation* between human beings and the natural world. "Let's keep it pure," came the decrees from every so-called "green" corporate headquarters. As late as 1989, a national company selling nature-related products ordered me to take the sound of human footsteps out of an album I made with a colleague. On that album, we needed the cadence of footsteps to convey a sense of the rhythm of a walking journey…" [2]

In the above case, Krause's composition required footsteps. In many other cases, there were simply humans there. In all cases, the recording did not make itself, but was made by someone who was present, in the space, with a recording instrument. Certainly, the recordist has the option of editing out

human sounds, or leaving the area after pressing the record button. However, as a frequently expressed request, this insistence upon a false purity exposes the shared belief that humans are separate from nature. There are planes in the sky and roads filled with cars all around because we put them there. The drive to keep all of these things out of our sonic representations fulfills a need for reassurance that our environment is undisturbed, that everything is fine. During a studio visit with the artist Nyeema Morgan, in response to a field recording I had played her (which contained some of my footsteps), she talked about how she preferred to hear signs of humans in the recordings, how she wanted signs of human bodies; she wanted people "implicated" in the recording.[3] That notion stuck with me, and validated my own preference for some indication of the human presence—in this case, two of my colleagues in the South African residency are heard speaking.

In this work, as in the previous efforts, the disparate sonic aspects of a circumscribed area are revealed as a harmonious whole in the present sonic Field. Dispersed throughout the geography of the Field, the voices come and go as they desire, improvising in service of their momentary needs. Their proceedings collectively create the resultant morphology of the piece.

CONCLUSION

The history of one strand of the development of Western art music, as traced above in Chapter 1, outlines the complete breakdown and reformulation of a long-established expressive language. That language was (and is) made up of objects entirely abstracted from the world: tempered pitches, scales, triadic harmony. In a relatively short period of time—it is 148 years from Wagner's *Tristan und Isolde* to Francisco López's *Conops*—we see more dramatic change than occurred in the previous three or four hundred years.

However, to focus on the breakdown and ultimate dissolution of traditional ways of working would be to miss the amazing changes which allowed any sound—ambient noises, environmental sounds, both those of nature and as the human-dominated cityscape, electronically generated or modified sounds, and sounds from outside the range of human hearing—all of these were now available as expressive material. This expanded palette subsequently dramatically increased the topics available for consideration.

That story continues into the present, describing this composer's attempt to theorize a way forward utilizing ideas and methods in line with his values. The Field contextualizes an approach to an expanded simultaneity driven for me by an analogous approach to field recording. However, the schematic model of The Field works analytically as well, as a way to understand existing works, regardless of input or constructive methods.

The portfolio of works indicates shifts of focus. Over the course of time, one quasi-documentary art medium—photography—falls away and is supplanted by field recording, not coincidentally another quasi-documentary medium. These media provide for a more indicative perspective than, e.g.,

traditionally musical materials, pointing outward at the world. Largely for the same reasons, performative work (generally utilizing traditional instruments) also decreases over time, giving way to electroacoustic composition.

By building my compositional work with The Field as a basis (a model which is an aspect of the world), rather than the logical model of the system of Western harmony (logic being an aspect of humanity), my goal is to affirm the world as the appropriate precondition of human activity rather than the hubris of human subjectivity.

NOTES

INTRODUCTION

1. Throughout, I use the term 'electroacoustic music' in accordance with Leigh Landy's sense 1 in his survey of definitions of electroacoustic music in *Understanding the Art of Sound Organization*; for convenience, the definition follows here: "1. Electroacoustic music refers to any music in which electricity has had some involvement in sound registration [i.e., recording] and/or production other than that of simple microphone recording or amplification." (Landy, *Understanding*, 13.) As stated, the term specifically addresses the processing or manipulation of recorded sound. In this volume, amongst other tasks, Landy, a musicologist, educator and composer, undertakes a thorough review and, where necessary, revision of the terminology involved in electronically-produced music and the sonic arts generally.
2. "The hubris of human subjectivity" is a phase which Michael Lang, my thesis committee co-chair, used during a discussion of my ongoing work on this thesis. It is simply too concise and apropos to pass up, encapsulating a notion I had been alluding to but failing to succinctly express. Related via personal email from the author, August 6, 2019.

CHAPTER 1 – FROM HARMONY TO THE FIELD (CONTEXTUAL REVIEW AND THESIS)

1. In this paper, I use the phrase "Western harmonic tradition" to refer specifically to the system of musical organization based on major and minor scales anchored on tonal centers, which imply chord progressions that guide melodies and drives dramatic forms of tension and release. This system arose in the late-sixteenth to early-seventeenth centuries out of earlier practices and is still in use in much music made today. When I discuss the exhaustion and collapse of this tradition, I am speaking of its waning relevance as a means of artistic expression. It is clearly still the preferred mode of musical procedure in many situations.
2. The term 'music drama' was coined by Richard Wagner to describe the synthetic nature of his later work and to differentiate it from traditional opera. After *Lohengrin* (1850), most of Wagner's mature works fuse musical and dramatic substance in a far more thoroughgoing fashion than German or Italian opera. They consequently employ different musical and structural techniques. In addition, they subordinate the musical aspect to the dramatic, which inverts the traditional priorities. They are thus properly called music dramas rather than operas. Wagner's term for them was Gesamtkunstwerken, which roughly translates as "complete" or "total artwork," expressing his goal

of employing all of the arts in their production, i.e., poetry, acting (drama), visible stage setting, and music. See Grout, *A History of Western Music*, 612–617.

3. Grout, 610.
4. Grout, 626.
5. Grout, 629.
6. Eisley, *Darwin's Century*, 255–56.
7. Grout, 644.
8. In the modern traditional Western musical system of notes (after, say, about 1800), the octave, which is the distance between the first *do* and the last *do* in the sequence *do - re - mi - fa - sol - la - ti - do*, is divided into 12 equal steps called 'half-steps' or 'semitones'. A semitone may also be understood as the distance between any two adjacent notes on the piano or any two frets on a guitar. A quarter-tone is half the size of a semitone, and would lie half-way between any of the two keys on a piano. These notes are not available on most instruments; in the case of the piano, drastic retuning is required.
9. Cage, *Silence*, 3–4. From a talk given by Cage at a meeting of a Seattle, Washington arts society organized by Bonnie Bird in 1937.
10. Schuller and Varèse, "Conversation with Varèse," 32.
11. Rich, *American Pioneers: Ives to Cage and Beyond*, 82. Busoni's tract was entitled *Sketch of a New Esthetic of Music*. See below, section 1.3.1, for more on this.
12. Rich, 83.
13. Rich, 92.
14. Chou, "Varèse: A Sketch of the Man and His Music," 157.
15. Nyman, *Experimental Music: Cage and beyond*, 39 (with original emphasis).
16. Chadabe, *Electric Sound*, 3.
17. Luciano Chessa, email to the author, July 2, 2019.
18. Chessa, *Luigi Russolo*, 231, n3. See bibliography (below) for the full reference for the volume by Brown referred to under Luigi Russolo, *The Art of Noises*.
19. Luciano Chessa, email to the author, July 2, 2019. "See my book" refers to Chessa, *Luigi Russolo*, 269, n33, where this anecdote is told more fully.
20. Chadabe, 21.
21. Busoni, *Sketch of a New Esthetic of Music*, verso.
22. My summary of Russolo's work is drawn from Chadabe, 2–3.
23. One 'prepares' a piano in order to turn it into a percussion instrument played from a piano keyboard by inserting nuts, bolts, screws, an eraser, pennies, pieces of plastic, rubber, slit bamboo, weather strip, wood, and other materials into the strings of the piano according to a table of preparations for a given work. My list of materials here is from Candy Cohen's liner notes to John Cage, *Sonatas and Interludes for Prepared Piano*, Tomato Records, 1977. See discography for full

reference. This album also reproduces in full Cage's table of preparations for the *Sonatas and Interludes*, a fascinating read.

24. This circumscribed John Cage overview is drawn from Chadabe, 25–26.
25. It is worth noting here that Cage's recourse to rhythmic and time-based structural strategies are a logical and ingenious solution to a composerly shortcoming pointed out to him by his most influential teacher, Arnold Schoenberg. (James Pritchett states unequivocally that "Schoenberg… changed Cage's life." in Pritchett, *Music of John Cage*, 9.) Cage studied with Schoenberg for two years, 1935–37. (Pritchett, 9.) In an anecdote oft-related by himself and others, Cage says "After I had been studying with him for two years, Schoenberg said, 'In order to write music, you must have a feeling for harmony.' I explained to him that I had no feeling for harmony. He then said that I would always encounter an obstacle, that it would be as though I came to a wall through which I could not pass. I said 'In that case I will devote my life to beating my head against that wall.'" (Cage, *Silence*, 261.) So, by composing music utilizing temporal structures and percussion ensembles, Cage was in effect making an end-run around his harmonic wall rather than beating his head against it.
26. Cross, "Electronic Music," 32.
27. Chadabe, *Electric Sound*, 27.
28. Michel Chion worked closely with Schaeffer in the *Groupe de recherches musicales* (GRM) at the *Office de Radiodiffusion-télévision française* (ORTF) from 1971 – 1976. (See the biography on Chion's Web site, accessed on June 24, 2019 at http://michelchion.com/biography, ¶ 3.) Among many other works, Chion wrote *Guide des objets sonores: Pierre Schaeffer et la recherche musicale* ("Guide to Sound Objects: Pierre Schaeffer and Musical Research") in 1983. Both concise and thorough, Chion's *Guide* compiles a list of Schaeffer's musical terminology, describing and defining each term. The *Guide des objets sonores* was translated as *Guide to Sound Objects* in 2009 by John Dack and Christine North.
29. Chion, *Guide to Sound Objects*, 30 (with original emphasis).
30. Chion, *Guide to Sound Objects*, 30–31.
31. Schaeffer, "Étude aux chemins de fer" (compact disc).
32. Chion, *Guide to Sound Objects*, 32 (with original emphasis).
33. This is Joel Chadabe's idea, related in conversation to N.B. Aldrich, 2002.
34. Rich, *American Pioneers*, 35.
35. Schiff, *Carter*, 29–30.
36. See Schiff, *Carter*, 46–49.
37. Carter, *The String Quartets*, 1–20.
38. Carter, vii.
39. Carter, viii.
40. Edwards, *Flawed Words*, 101.
41. Carter, *Double Concerto*, viii.

42. See Perlis, *Charles Ives Remembered*, 145. Here, I'm indebted to David Schiff (*Carter*, 56 n6) for pointing me to David Thurmaier, "'A Disturbing Lack of Musical and Stylistic Continuity'?", 97, which pointed me to the Perlis which was sitting in my bookcase(!).
43. Chadabe, *Electric Sound*, 22.
44. Rich, *American Pioneers: Ives to Cage and Beyond*, 141.
45. The preceding summary of *HPSCHD* here is based on Pritchett, *Music of John Cage*, 159.
46. Many commentators (Chadabe, Kostelanetz, Pritchett, e.g.) report the number of tape recorders involved in the *HPSCHD* production at UIUC as fifty one. The number is in fact fifty two, as explained at the very bottom of the "Cage at UIUC" page at the University Library website, University of Illinois, Urbana-Champaign. Accessed July 8, 2019, https://www.library.illinois.edu/mpal/about/exhibits/johncage/, ¶ the last.
47. My whole preceding description of *HPSCHD* is from Joseph, *Experimentations: John Cage in Music, Art and Architecture*, 173–176.
48. "Cage at UIUC," at the University Library website, University of Illinois, Urbana-Champaign. Accessed July 8, 2019, https://www.library.illinois.edu/mpal/about/exhibits/johncage/, ¶ 2.
29. Chadabe, *Electric Sound*, 276.
50. Stockhausen, *Nr. 6 Gruppen für drei Orchester*, not paginated.
51. Stockhausen, *Stockhausen On Music*, 63.
52. Stockhausen, 64. Other sources indicate the start of *Momente*'s composition as January, 1962. It is entirely possible they are correct.
53. Stockhausen, 64.
54. Stockhausen, *Nr. 6 Gruppen*, 95.
55. Eötvös, *Gruppen*, compact disc.
56. Stockhausen, *Nr. 6 Gruppen*, not paginated.
57. Schiff, *Music of Elliott Carter*, 306–307.
58. Carter, *A Symphony of Three Orchestras*, program notes, not paginated.
59. For a gloss on the term 'electroacoustic music,' see note 1 in INTRODUCTION.
60. Grout, *History of Western Music*, 17.
61. Grout, 289.
62. Grout, 290.
63. N.B. Aldrich, "Phenomenological Listening," 2004, on Aldrich's website, accessed July 9, 2019, http://nbaldrich.com/media/pdfs/phenomenological_listening.pdf, 3.
64. For the details regarding *Williams Mix*, I am indebted to Chadabe, *Electric Sound*, 55–57.
65. Chadabe, *Electric Sound*, 62.
66. Varèse, "The Liberation of Sound," 207.
67. Schafer, "The Music of the Environment," 31. The *Music of the Environment* was a thirty-five-page pamphlet published in 1973 (Wien: Universal Edition); the source here is a ten-page excerpt in Cox

and Warner's collection, *Audio Culture*. A good deal of this publication (if not the entire thing) was reworked (along with a few other of Schafer's pamphlets) into portions of his full length monograph, *The Tuning of the World* (1977). The present passage opens the introduction of that volume.

68. Although slight in size (35 pages), *The Music of The Environment* was influential by virtue of its Viennese publisher, Universal Edition, a preeminent publisher of progressive Romantic and twentieth century modernist music whose publications include the scores of Strauss, Mahler, Schönberg, Webern, Stockhausen, Steve Reich, &c.
69. I owe this summary, from the Cage quotation down, to Schafer, "The Music of the Environment," 32. Any emphasis in quotation is original.
70. See the World Soundscape Project website, accessed July 14, 2019, https://www.sfu.ca/sonic-studio-webdav/WSP/index.html.
71. Schafer, "Preface," liner notes to *The Vancouver Soundscape*. Available on the World Soundscape Project website, accessed July 14, 2019, http://www.sfu.ca/sonic-studio-webdav/WSP_Doc/Booklets//Vanscape1.pdf
72. Note that *The Tuning of the World* was republished in 1994 in a new printing of the old edition, by a new publisher, with a reconfigured title: *The Soundscape, Our Sonic Environment and the Tuning of the World* (Rochester, Vermont: Destiny Books, 1994).
73. All of these definitions are from the Glossary in Schafer, *The Tuning of the World*, 272–274.
74. Truax, interview with *Asymmetry Music Magazine*, now available only at Barry's website, at https://www.sfu.ca/~truax/Asymmetry_Truax.pdf, ¶ 23. Accessed August 14, 2019.
75. Toru Iwatake, "Interview with Barry Truax", August 7, 1991, originally in *Computer Music Journal*, 18(3), 1994, 17-24. At https://www.sfu.ca/~truax/barry.html. Accessed on August 14, 2019.
76. Truax, "Homoeroticism and Electroacoustic Music: Absence and Personal Voice," originally in *Organised Sound*, 8(1), 2003, pp. 117–124. At https://www.sfu.ca/~truax/cd6a.html, accessed August 14, 2019.
77. Truax, interview with *Asymmetry Music Magazine*, ¶ 4.
78. Truax, interview with *Asymmetry Music Magazine*, ¶ 26.
79. Truax, "Soundscape Composition as Global Music," 108.
80. Truax, 105.
81. Maksymilian Kapelanski, "Acoustic Ecology and the Soundscape Bibliography," compiled October 2003, at *Leonardo on-line*, https://www.leonardo.info/isast/spec.projects/acousticecologybib.html, accessed August 14, 2019.
82. Truax, "Soundscape Composition as Global Music," 104.
83. Krause, Bernie, "The niche hypothesis: A hidden symphony of animal sounds, the origins of musical expression and the health of habitats," in *Explorers Journal*, 71/4, pp. 156–160. Krause's "niche hypothesis" claims that groups of heterogeneous vocalizing animals which evolve together manage

to stake out unique bands in the frequency spectrum so that they can be heard by their intended receivers when all the animals are calling at the same time. Krause has amassed soundscape recordings numbering in the thousands which have been analysed via spectrogramically, and which appear to support the hypothesis. (I am unable to locate the *Explorers Journal*. However, Krause discusses the phenomena and hypothesis in his book *The Great Animal Orchestra*, 2012, 98–100.)

84. Truax, interview with *Asymmetry Music Magazine*, ¶ 13.
85. *The Canadian Encyclopedia*, s.v. Hildegard Westerkamp, at https://www.thecanadianencyclopedia.ca/en/article/hildegard-westerkamp-emc. Accessed August 14, 2019.
86. Schafer, *The Tuning of the World*, 212.
87. Hildegard Westerkamp, "Soundwalking," originally published in *Sound Heritage*, III/4, Victoria B.C., 1974, ¶ 1. Revised 2001, and available on Westerkamp's website, accessed August 14, 2019, at https://www.sfu.ca/~westerka/writings%20page/articles%20pages/soundwalking.html.
88. Hildegard Westerkamp, *Transformations*, compact disc liner notes, 23.
89. Christina Kubisch, "Electrical Walks: Electromagnetic Investigations in the City," from the author's website, accessed August 15, 2019, at http://www.christinakubisch.de/en/works/electrical_walks.
90. *On The Machair* may be heard on the work's page on Cathy Lane's website dedicated to *The Hebrides Suite*, of which *On The Machair* is a part: https://hebrides-suite.co.uk/works-2/on-the-machair/, accessed August 15, 2019.
91. The background information from his youth was related by López to the author in an unpublished interview taken on November 19, 2019 in Limpopo Province, Republic of South Africa.
92. Francisco López, liner notes to *La Selva*, 6.
93. López, liners to *La Selva*, 5–6.
94. All quotations in this paragraph are López, interviewed by the author, November 19, 2018.
95. López, liners to *La Selva*, 4.
96. Varèse is quoted here in Rich, *American Pioneers*, 89.
97. Robert K. Barnhart, ed., *Chambers Dictionary of Etymology* (Edinburgh and New York: Chambers Harrap Publishers Ltd, 1988), s.v. "field."
98. *OED Online* (March 2019), s.v. "field," accessed April 25, 2019, http://www.oed.com/view/Entry/69922?rskey=SVhDnZ&result=1.
99. For a lovely and appreciative rumination on the field and its possibilities as an inducement to connectedness to the world, see John Berger's brief essay, "Field," written in 1971 and available in both *About Looking* (1980) and *Selected Essays* (2001). Further, this essay is a touchstone for the editors and a prompt to the contributors to Stephen Benson and Will Montgomery's *Writing the Field Recording*, and is reprinted there, 31–35.
100. *OED Online* (March 2019), s.v. "model," accessed August 3, 2019, http://www.oed.com/view/Entry/120577?rskey=3qUhHo&result=1.

101. *OED Online* (March 2019), s.v. "ecosystem," accessed August 3, 2019, http://www.oed.com/view/Entry/59402?redirectedFrom=ecosystem#eid.
102 Why call out these various input devices (e.g., hydrophones, contact mics, &c.)? In the author's practice working with the notion of the Field, it is important to gather as many sonic aspects of a circumscribed physical area as possible, in order to render as many possible voices in the work. This way, voices can be made audible which are not so when one is simply there, in the space, listening only with one's ears. The work then reveals the space as a far fuller, richer sonic simultaneity than is normally evident.
103. For much more on this, see Benson and Montgomery, "Introduction," in *Writing the Field Recording*, 1–30. I am indebted to this volume for inspiration on this topic.
104. For a practicum on "framing," see Pisaro, "Ten framing considerations of the field."
105. Manovich, "Database as a Genre of New Media," 177.
106. Manovich, "Database," 178.
107. Kubisch, "Uber die Stille 1997," 33.
108. Kubisch, 31–33.
109. Loop, "'Angels & Insects': a fascinating study," ¶ 29.
110. Dunn, *Angels & Insects*, compact disc liner notes. Cited in Lander, "Paul DeMarinis, Music as a Second Language," 145.

CHAPTER 2 – PORTFOLIO OF WORKS

1. See Christian Höller at the *See This Sound* blog for a reproduction of the score to Conrad's *Three Loops for Performers and Tape Recorders*, http://www.see-this-sound.at/works/896/asset/496.html. Conrad discusses the piece and its context briefly in an interview on the EST Magazine website, conducted via email with Brian Duguid in 1996, at http://media.hyperreal.org/zines/est/intervs/conrad.html, ¶ 47. Both of these sites were accessed August 6, 2019.
2. Except for the material on Tony Conrad (see immediately above), most of the details in this paragraph were gleaned from two Web pages: Michael Peters, "The Birth of the Loop, A Short History of Looping Music," last updated 2006, http://www.loopers-delight.com/history/Loophist.html, and Sean Costello, "Early Tape Loop Experiments With Eno, Fripp, Terry Riley, And Pauline Oliveros," posted May 6, 2010, https://valhalladsp.com/2010/05/26/early-tape-loop-experiments-with-eno-fripp-terry-riley-and-pauline-oliveros/. Both accessed October 23, 2018. Material not found in those sources is based on primary sources in my own record collection.
3. Higgins, "Boredom and Danger", 1966, ¶ 3.
4. Orledge, "Satie's musical and personal logic", abstract.
5. Orledge, "Satie's musical… logic", ¶ 7.

6. Whittington, *Serious Immobilities: On the centenary of Erik Satie's Vexations*, third figure.
7. Sweet, "A Dangerous and Evil Piano Piece", ¶ 4.
8. Bryars, "Vexations and its Performers", 12 – 20.
9. Beckett, *Worstward Ho*, 38.
10. Beckett, *Worstward*, 19.
11. Beckett, *Worstward*, 24.
12. Beckett, *Worstward*, 13.
13. Beckett, *Worstward*, 13.
14. Casanova, *Samuel Beckett*, 18 and thenceforth.
15. Beckett, *Worstward*, 38.
16. Voegelin, *Listening to Noise and Silence*, xii.
17. Voegelin, *Listening*, 36, last paragraph.
18. Beckett, *Worstward*, 13.
19. Bruyninckx, *Listening in the Field: Recording and the Science of Birdsong*, 3.
20. Michael Lang, personal discussion with author, April 9, 2019.
21. For the interested reader, here are the details regarding the input methods for *field: snowfall*. The sounds of the local soundscape were captured with a stereo condenser microphone in a blimp-and-fuzzy-windscreen setup, to minimize microphonic wind noise. The following four devices all contribute to the complex of snowfall rhythms:
    - a hydrophone lying on the surface of the snow
    - a contact mic lying on the surface of the snow
    - a small condenser mic in a tin can also lying in the snow
    - a contact mic taped to one of the windows of my breezeway
22. See the webpage for the Sonic Mmabolela residency at Francisco López's website, accessed August 16, 2019, http://www.franciscolopez.net/field.html.

CHAPTER 3 – THESIS PROJECT

1. Subwoofers are enclosures holding large speakers (typically twelve to eighteen inches in diameter) which are optimized to reproduce bass frequencies from approximately 120 Hz to below the threshold of human hearing. They are often equipped with a filter which allows only sounds at or below the specified frequency to pass to the speaker.
2. Bernie Krause, *Notes from the Wild*, 24 (with original emphasis).
3. Nyeema Morgan, personal conversation with the author, February 27, 2019.

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BIOGRAPHY OF THE AUTHOR

Steve Norton (b. 1958, Glens Falls, New York) is a sound artist and musician. His artistic research examines electroacoustic music, improvisation as a method, the environment, modernity and society.

Steve's practice is currently focused on the gathering of field-recorded sound which he utilizes in electroacoustic composition as well as in performative, improvisational contexts. His interest is to increasingly bring the outside world into his work via field recording and topical decisions which engage issues of critical concern. This is exemplified by his recent work, *Requiem*, a four-channel sound composition on the topic of extinction, created using the voices of recently-extinct birds and frogs.

Steve has composed and performed avant-garde jazz, free improvisation and experimental music in Boston and around the US and Canada for over 30 years, and has over 25 recorded releases to his credit. He is a candidate for the Master of Fine Arts in Intermedia from the University of Maine in August, 2019.